Dec. 24, 1946. A. F. WORSHAM 2,413,206

PICK-UP ARM

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Fig. 1.

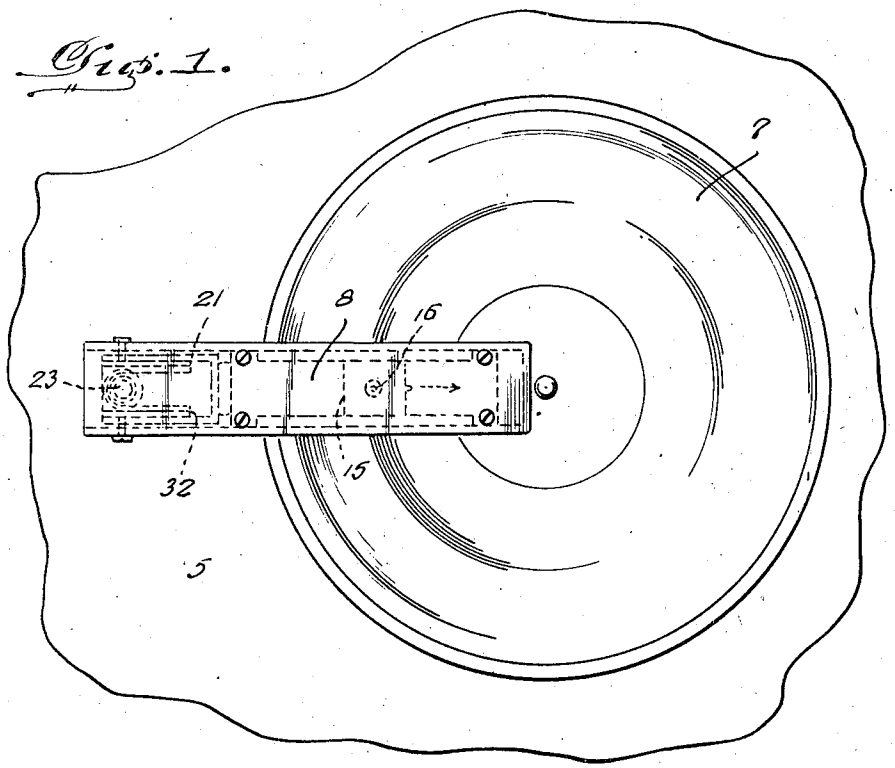


Fig. 2.

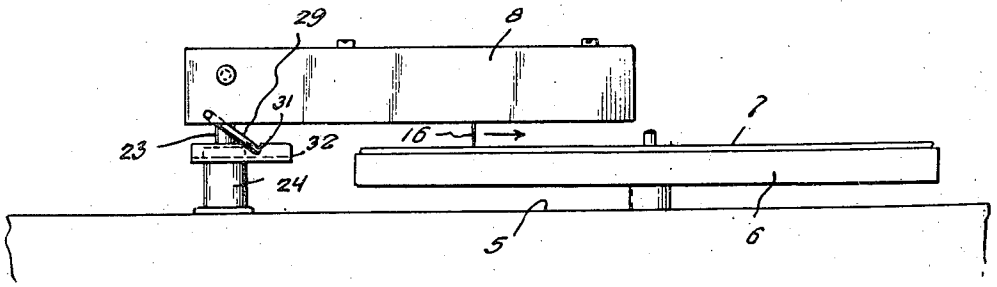
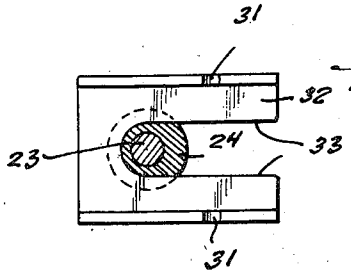


Fig. 3.



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Fig. 3.

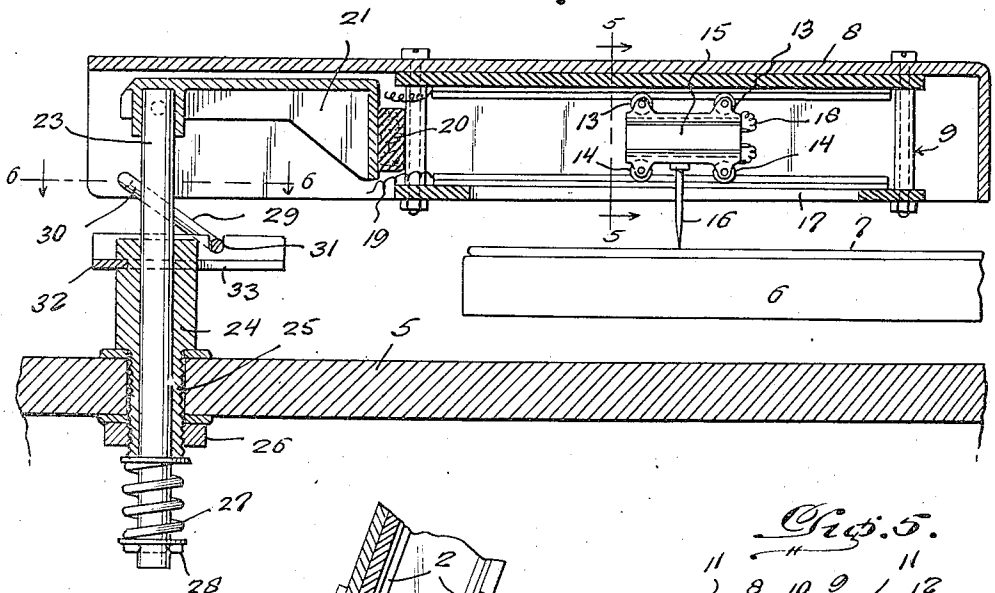


Fig. 4.

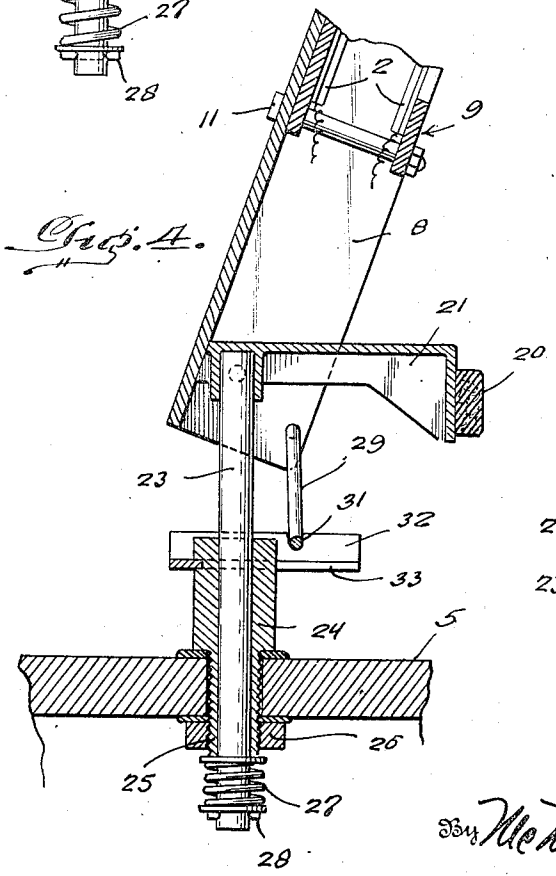


Fig. 5.

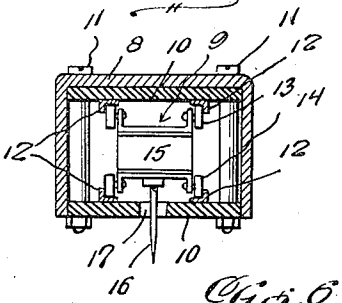
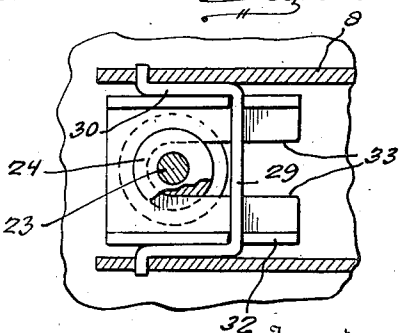


Fig. 6.



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PICKUP ARM

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Application November 18, 1943, Serial No. 510,809

2 Claims. (Cl. 179—100.41)

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This invention relates to a pickup arm for phonographs and similar devices, and has for the primary object the provision of a device of this character which will provide zero tracking of the sound grooves of a record, that is the needle or stylus of the pickup arm will be maintained tangent to the sound grooves for the entire movement of the pickup head across the record and thereby eliminate tracking errors which occur by the use of the conventional swingable type of tone or pickup arm.

With these and other objects in view as will become more apparent as the description proceeds, the invention consists in certain novel features of construction, combination and arrangement of parts as will be hereinafter more fully described and claimed.

For a complete understanding of my invention, reference is to be had to the following description and accompanying drawings, in which

Figure 1 is a top plan view illustrating a pickup arm and pickup head constructed in accordance with my invention and showing the pickup arm and head associated with a record on a turntable of a phonograph or similar device.

Figure 2 is a side elevation illustrating the same.

Figure 3 is a vertical sectional view illustrating the pickup arm and pickup head carried thereby and the mounting for the pickup arm.

Figure 4 is a fragmentry vertical sectional view illustrating the pickup arm in an inoperative position.

Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 3.

Figure 6 is a fragmentary sectional view taken on the lin 6—6 of Figure 3.

Figure 7 is a view similar to Figure 6 with the pickup arm removed.

Referring in detail to the drawings, the numeral 5 indicates a fragmentary portion of a case or cabinet of a phonograph or similar device and 6 the turntable on which the record 7 is arranged for rotation. The record is in disc form with the sound grooves disposed uppermost. It is customary in phonograph construction to provide a pickup arm mounted on the case or cabinet for swinging movement relative to the turntable so that a record may be placed on and removed from the turntable and also whereby the stylus of the pickup arm may track in the sound grooves. A pickup arm of this character produces tracking errors, and in order to have zero tracking of the sound grooves by the stylus the stylus at all times at its point of contact with the sound grooves must be tangent to the oncoming groove and which cannot be accomplished by a swingable pickup arm of the character mentioned, consequently resulting in tracking errors.

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It is the purpose of the present invention to eliminate the tracking errors and to produce zero tracking by maintaining the point of contact of the stylus or needle tangent to the sound grooves entirely across the record.

In the present invention the pickup arm is designated by the character 8 and is mounted horizontally so as to traverse the record as shown in Figures 1 to 3, inclusive, of the drawings. The pickup arm 8 is of inverted channel formation and has mounted therein a track assembly 9 including upper and lower spaced insulating plates 10 detachably connected together by bolts 11 which also pass through the pickup arm or the top wall thereof. Angle iron rails 12 of conductive material are secured to the opposing faces of the plates 10 to be engaged by rollers 13 and 14 of a pickup head 15. The pickup head 15 is of the electrical type and the rollers thereof are arranged in upper and lower pairs to engage the upper and lower rails. The upper and lower rollers are insulated from each other. The needle or stylus of the pickup head is indicated by the character 16 and operates through a slot 17 provided in the lower plate 10 to engage in the sound grooves of the record 7.

Conductors 18 electrically connect the rollers to the stylus and the rails have electrical conductors 19 connected thereto which are in turn connected to the usual electrical amplifier of the phonograph or similar device (not shown).

The pickup head 15 is free to move endwise of the pickup arm and its movement is checked by a cushion block 20 carried by combined fulcrum and stop arm 21 when the pickup arm is moved into inoperative position, as shown in Figure 4. The combined fulcrum and stop arm is arranged horizontally within one end portion of the pickup arm and is pinned to a supporting shaft 23 journaled in a sleeve 24 and is also capable of having sliding movement in said sleeve.

The sleeve 24 has a screw threaded portion 25 to extend through an opening provided in the case or cabinet 5 and has threaded thereon a retaining nut 26. The screw threaded portion 25 is slightly reduced in diameter over the remaining portion of the sleeve so as to form a shoulder to cooperate with the nut 26 in securing the sleeve in place. A coil spring 27 surrounds the lower end portion of the shaft 23 and bears against the lower end of the screw threaded portion 25 of

the sleeve and a pin **28** carried by the shaft, the purpose of which is to urge the shaft downwardly relative to the turntable.

A substantially U-shaped hinge member **29** is pivotally connected to the pickup arm and has the shaft **23** extending therethrough and rests in notches **31** of a supporting plate **32** carried by the sleeve **24**. The supporting plate is of channel formation and is arranged horizontally and is provided with a slot **33** opening through one end thereof. The slot permits the supporting plate to straddle the sleeve with portions thereof fitting in a groove provided in the sleeve. If desired, the supporting plate after being assembled on the sleeve as specified may be welded or otherwise secured thereto. The hinge member **30** connecting the pickup arm to the supporting plate **32** as specified, will permit said pickup arm to be swung upwardly fulcruming on the combined fulcrum and stop arm **21**, as shown in Figure 4, so that the pickup arm will be clear of the turntable whereby a record may be removed and another placed thereon without interference from the pickup arm. When the pickup arm assumes an inoperative position, the pickup head slides in engagement with the cushion **20**, repositioning the pickup head for the playing of the next record. The pickup head is caused to travel to the right of the pickup arm during the engagement of the stylus with the sound grooves, the point of contact between the stylus and the sound grooves being tangent to the sound grooves thereby providing zero tracking.

While I have shown and described the preferred embodiment of my invention, it will be understood that minor changes in construction, combination and arrangement of parts may be made without departing from the spirit and scope of the invention claimed.

Having thus described the invention, what I claim is:

1. In a pickup device, a pickup arm arranged horizontally and traversing a horizontally arranged record, a track assembly carried by said pickup arm and providing electrical conductors, means electrically connecting the track assembly to a sound amplifier, an electrical type pickup head slidably supported by the track assembly and including a stylus to engage the sound grooves and having its point of contact with the the sound grooves maintained tangentially thereto by the pickup arm, a combined fulcrum and stop, a cushion carried by the combined fulcrum and stop to be engaged by an endwise movement of the pickup head, a shaft secured to the combined fulcrum and stop, a sleeve receiving said shaft and secured to a support adjacent the record with the shaft slidable therein, tension means between the sleeve and the shaft, and a hinge connection between the pickup arm and the sleeve.

2. In a pickup device, a pickup arm arranged horizontally and traversing a horizontally arranged record, a track assembly carried by said pickup arm and providing electrical conductors, means electrically connecting the track assembly to a sound amplifier, an electrical type pickup head slidably supported by the track assembly and including a stylus to engage the sound grooves and having its point of contact with the sound grooves maintained tangentially thereto by the pickup arm, a combined fulcrum and stop, a cushion carried by the combined fulcrum and stop to be engaged by an endwise movement of the pickup head, a shaft secured to the combined fulcrum and stop, a sleeve receiving said shaft and secured to a support adjacent the record with the shaft slidable therein, tension means between the sleeve and shaft, a supporting plate secured to the sleeve and arranged horizontally and having notches, a hinge element pivoted to the pickup arm and received by the notches and straddling the shaft.

ARTHUR F. WORSHAM.