This invention relates to pick-up arms in phonographs and relates more particularly to the pivoting mounting of a pick-up arm for its movements in a vertical plane.

It is well known that a pick-up arm, besides being pivoted on a vertical axis to carry out its reproduction movement from the periphery towards the center of the record, is also pivoted on a horizontal axis for its movements in a vertical plane which are necessary either to follow a possible unevenness in the level of the record or to allow the arm to be raised to return it in its starting position or for changing the stylus.

On the other hand it is well known that in order to relieve the pick-up arm from the major part of its weight as it is required for a good reproduction, a spring is anchored between a plate fixed to the pin for the horizontal pivoting and said arm which generates a component opposing the weight. For constructional requirements said spring is directed so that it provides a component along the horizontal pivoting axis of the arm.

This component which provides an undesirable thrust of the arm against its vertical pin, is used advantageously according to the present invention to provide a horizontal pivoting mounting of the arm which is particularly simple and inexpensive.

The horizontal pivoting arrangement of the pick-up arm according to the invention is characterized in that the anchoring plate of the weight relieving spring has a substantially U-shaped portion, a vertical leg of which carries a pin supported in a seat in a vertical wall of said pick-up arm, and the opposite leg carries a seat adapted to receive a pin which is carried by the opposite vertical wall of said pick-up arm and is concentric to said pin carried by said plate, the mounting of said pin carried by said plate in said seat in said arm being by means of a thrust bearing comprising preferably a ball.

The invention will be better understood from the following detailed description, taken purely as an example and therefore in no limiting sense, of an embodiment thereof, with reference to the accompanying drawing, in which:

Fig. 2 is a sectional view in side elevation of a pivoting arrangement according to the invention;

Fig. 1 is a sectional view in side elevation of a pivoting arrangement according to the invention;

Fig. 3 is a cross sectional view of the arrangement of Figs. 1 and 2, taken along line 3—3 of Fig. 2.

Referring to the drawings, the pivot pin 1 of the pick-up arm carries a plate 2 having at an end thereof a U-shaped portion 3, a leg wherein extends in an eye 4 to which a relief spring 5 is anchored which is anchored at its other end to a lug 6 fixed to the pick-up arm 7.

One of the legs, 8, of the U portion 3 of the plate carries a pin 9 which is supported in a counter-bore 10 in a boss 11 of the pick-up arm, whereas the other leg, 12, of the U portion 3 has a bore 13 in which a pin 14 is supported projecting from a stud 15 threaded in a tapped hole 16 in a boss 17 of the arm 7. The pins 14 and 9 are concentric and a ball 18 is inserted between the end of the pin 9 and the bottom of the counter-bore 18.

The operation of the described pivoting arrangement is as follows:

The tension of the relief spring 5 has a component along the axis of pins 9, 14 which biases the plate 2 against the arm 7 and therefore the pin 9 against the ball 18 which operates as a thrust bearing. Thus, it is seen that because of the arrangement according to the invention the arm is pivoted on the horizontal axis with a smooth movement in spite of the thrust along the axis by the spring 5, and that by suitably using said thrust a partially rolling friction support of the pick-up arm is obtained by means of a single roll member comprising the ball 18.

While a single embodiment of the invention has been shown and described it is obvious that many changes and modifications can be made without departing from the scope of the invention.

I claim as my invention:

A pivoting device for the movements in a vertical plane of the pick-up arm of a phonograph of the type having an anchoring plate carried by the pivot pin of said arm and having a substantially U-shaped portion and a weight relieving spring anchored at one end to said pick-up arm and at the other end to said anchoring plate, said device comprising a first pin supported in a first seat provided in one vertical wall of said arm and mounted in a vertical leg of said U-shaped portion, a second pin, concentric with said first pin, extending into a second seat provided in the opposite leg of said U-shaped portion and supported in the wall of said arm opposite said one wall and a thrust bearing for said first pin comprising a ball or the like disposed adjacent said first seat, and one said leg of said U-shaped portion having an extension presenting an eye adapted to receive said other end of said spring.

References Cited in the file of this patent

UNITED STATES PATENTS

2,269,263 Guedon ---------------- Jan. 6, 1942
2,351,972 Johnson ---------------- June 20, 1944