Dec. 10, 1940. B. N. ALSBROOK, JR 2,224,332

PICKUP ARM CONSTRUCTION FOR PHONOGRAPHS

Filed April 22, 1940

Fig. 1.

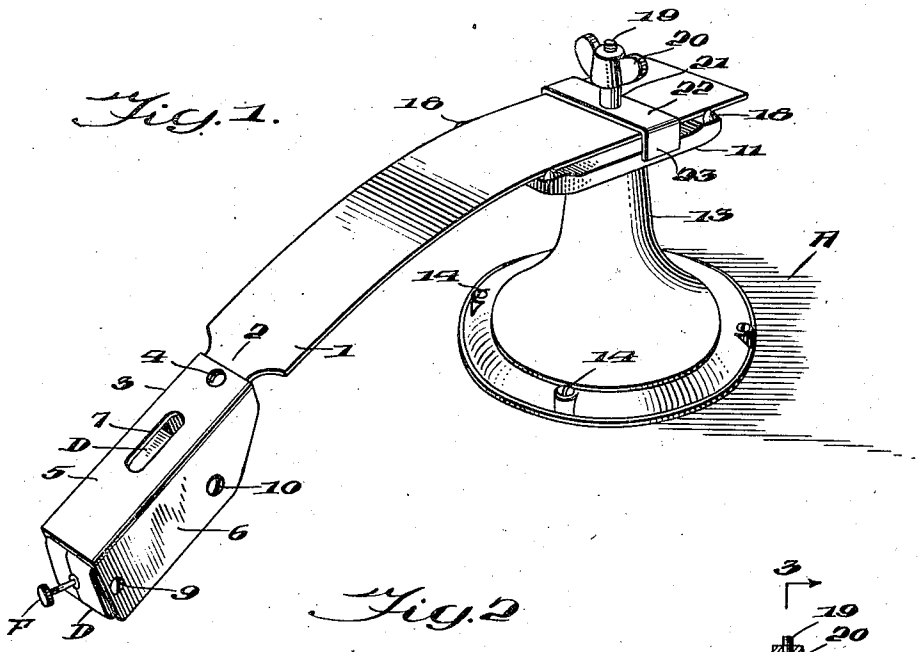


Fig. 2

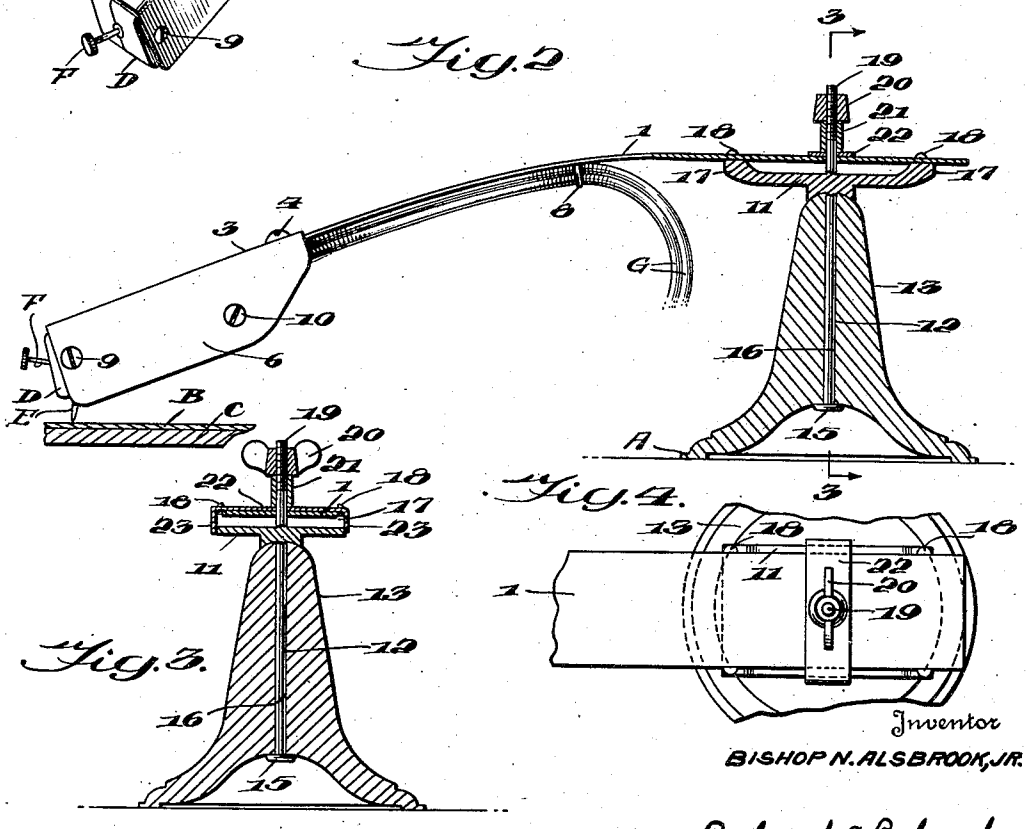


Fig. 3.

Fig. 4.

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PICKUP ARM CONSTRUCTION FOR PHONOGRAPHS

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7 Claims. (Cl. 274—1)

This invention relates to pickup arm constructions for phonographs, and more particularly to such constructions which are particularly adapted for use in connection with portable phonographs or phonographs installed or carried in automobiles or other places where they may be subjected to jolts or sudden movements during their operation, although my invention may also be advantageously applied to other phonographs or sound recording or reproducing machines.

The primary objects of the invention are: to provide an arm or mounting means for the sound pick-up unit of a phonograph which serves to at all times during operation maintain the needle of said unit in operative engagement in the groove of the record regardless of jolts or sudden movements of the phonograph which might tend to jar the needle out of the record groove; to provide in connection with such an arm novel simple means for adjusting the same to maintain the needle or stylus of the pickup device in engagement with the record at any desired degree of pressure; and to provide such a pickup arm construction which is of simple economical construction and operation, and which may be of very light weight if desired to reduce the moment of inertia at the free end of the pickup arm.

In this application I show and describe only the preferred embodiment of my invention simply by way of illustration of the practice of my invention, as by law required. However, I recognize that my invention is capable of other and different embodiments, and that the various details thereof may be modified in various ways, all without departing from my said invention; therefore the drawing and description herein are to be considered as merely illustrative and not as exclusive.

In the accompanying drawing:

Figure 1 represents a perspective view of a pickup arm construction embodying my invention;

Figure 2, a side elevation partly in section, of the device illustrated in Figure 1 with the pickup unit in engagement with a record;

Figure 3, a section on the line 3—3 of Figure 2, looking in the direction of the arrows; and,

Figure 4, a fragmentary top plan view of the preferred embodiment of my invention.

The preferred embodiment of my invention illustrated in the accompanying drawing broadly comprises a resilient pickup arm or member, a sound pickup unit carried at the free end of said arm in any suitable fashion, preferably being disposed in a suitable housing or casing, and suitable means for mounting said arm for swinging movement in a plane parallel to the surface of a record, with the needle of the pickup unit maintained in resilient engagement with the record by the resilient downward pressure of said arm. Also the preferred embodiment of my invention comprises means for adjusting the arm of the pickup arm construction to obtain the desired pressure of the needle on the record, though this feature is not essential to my invention considered from its broader aspects.

The preferred form of pickup arm 1 illustrated in the accompanying drawing consists of a preferably flat downwardly curved leaf spring or spring steel or other suitable resilient material member. In the form illustrated the arm 1 is formed with a narrow tip or free end portion 2 to extend into the casing of housing 3 for the pickup unit D, said casing 3 being rigidly attached to arm 1 by suitable means such as a bolt 4 passing through the overlapping portions of the casing top panel 5 and the tip 2 of arm 1.

However, said casing 3 merely constitutes one convenient and attractive means which may be employed for mounting or carrying the sound pickup device or unit D at the free end of arm 1, and may be modified or dispensed with if desired.

The particular form of casing 3 illustrated consists simply of a channeled or inverted U-shaped cross-section member, preferably formed from a single integral piece of aluminum or other preferably extremely light material having a flat top panel 5 and downwardly depending spaced sides or side panels 6 covering the respective top and side portions of the sound pickup unit D disposed therein. If desired the top panel 5 of the casing may be formed with an aperture 7 to permit inspection of the electrical connections or terminals of the wires G at the rear end of the pickup unit D.

The pickup device or unit D, preferably disposed in the casing 3 at the free end of pickup arm 1, may be of any usual type of preferably light weight preferably electrical pickup device or unit having the usual downwardly directed needle or stylus E adapted to engage in the sound groove of a record B disposed on the usual phonograph turn table C, said needle E being retained in position by the usual fastening screw F.

For the purpose of fastening the pickup unit D in casing 3, I prefer to employ screws 9 and 10 threaded through the sides or side panels 6 of said casing into suitable receiving sockets (not shown) formed in the pickup unit D.

When the pickup device D is of the electrical

type illustrated, the usual wires G conducting electric current to and from the unit D may, if desired, be disposed and concealed beneath the arm 1 by running them through a clip or eyelet 8 secured to the lower face of arm 1.

Although the mounting means for the pickup arm 1 may be of any type permitting free swinging movement of said arm in a lateral plane, or a plane parallel to the surface of record B, while in normal operation preventing vertical swinging movement (as distinguished from resilient bending in a vertical direction) of the arm 1, the preferred mounting means illustrated embodies in its construction a new and useful feature of my invention consisting of means for adjusting the arm 1 so as to obtain any desired resilient pressure of the needle E on record B.

Accordingly, the preferred form of mounting means for arm 1, as illustrated in the accompanying drawing, comprises a rotary plate or bracket 11 mounted for rotation in a lateral plane preferably by means of an integral perpendicular downwardly depending pivot or pin 12 freely rotatably journalled in the vertical bore 16 of a suitable stationary base 13 fixedly secured by screws 14 or other suitable means to the motor board or top panel A of the phonograph adjacent the turn table B. Vertical motion of the bracket 11 may be prevented by disposing the same in free rotating engagement with the upper portion of base 13 and by means of an enlargement or head 15 at the lower end of pivot pin 12 disposed in freely rotating engagement with the base 13 at the lower end of bore 16.

The bracket 11 is provided with spaced raised end portions or abutments or shoulders 17 and raised relatively spaced lugs or dogs 18 projecting upwardly from the opposed sides of each said shoulder 17, the end portion or pivoted end of pickup arm 1 resting on and extending between said raised shoulders 17, and being disposed and positioned between the lugs 18 of each shoulder, whereby said lugs 18 serve to prevent relative rotation between the arm 1 and plate or bracket 11. The lugs 18 however are not essential and may be omitted if desired.

Cooperating with the bracket 11, as thus far described, are suitable means for maintaining the arm 1 and bracket 11 in properly assembled relation and for exerting an adjustable downward pressure on the arm 1 at some point between the two spaced ribs or shoulders 17 on which the pivoted end of arm 1 rests, for the purpose of raising or lowering the free end of arm 1 and thereby regulating the resilient pressure of needle E on record B.

The means illustrated consists of an upwardly projecting screw-threaded pin or member 19 disposed on the upper face of bracket 11 medially between the shoulders 17 thereof, and passing through an aperture in the adjacent pivoted end of arm 1, to receive at its upper end a wing nut 20 which may be screwed or turned down to exert any desired degree of pressure on the arm 1. If desired, and as shown, a washer or sleeve 21 and a pressure distributing member 22 may be interposed about pin 19 between the nut 20 and arm 1, the member 22 serving to distribute the pressure evenly across the entire width of arm 1 and being prevented from rotation relative to said arm by means of downwardly turned ends or feet 23 vertically slidably engaging the side edges of bracket 11.

In the operation of my invention it may be seen that, as the downward pressure exerted by the nut 20 on arm 1 increases, the free end of the arm 1 tends to rise, thereby decreasing the pressure of the needle E on the record B, and as the pressure exerted by nut 20 decreases, the free end of arm 1 tends to descend or press against the record with an increasing pressure.

It is to be noted of course, that in order to function as above described, the arm 1 is so positioned and adjusted that, in the absence of the record B the point of needle E would normally be resiliently positioned or supported by arm 1 at a plane or level somewhat below the surface of the record; thus when the needle point is placed in operative engagement with the record the resilient arm 1 by its tendency to move towards or regain such normal position resiliently presses and maintains the needle E in engagement with record B and may be adjusted to prevent said needle from jumping or being jarred out of the record groove when the phonograph is subjected to such shocks or jolts as would ordinarily be encountered during transportation of the phonograph in an automobile or other vehicle. In fact it has been found that in operation the preferred embodiment of my invention herein described will maintain the needle E in operative engagement with the record B even though the phonograph is played in an upside down position.

Obviously when it is desired to remove or change the record, the resiliency of arm 1 permits the needle E to be lifted out of engagement with the record whereupon the arm may be swung laterally off of the record without changing the setting of the pressure adjusting nut 20.

The hereinbefore mentioned light weight of the pickup unit D and casing 3, in accordance with the preferred construction of the invention, serves to increase the efficiency thereof in that it reduces the moment of inertia at the free end of said pick up arm 1, thereby reducing the tendency of the needle E to bounce out of the record groove when jolted, and accordingly requiring less pressure of the needle E on the record than would otherwise be the case.

It is to be noted that, in addition to its other advantages, my invention is particularly adapted for use with records which have become warped due to heat or other causes, as it will permit the needle to move up or down in engagement with the high or low portions of the record, while at the same time maintaining a substantially constant pressure between the record and needle and preventing the needle from bouncing out of its groove.

I claim:

1. A pickup arm construction for phonographs comprising a stationary base, a pickup arm mounting and adjusting bracket mounted on said base for swinging movement in a lateral plane, a pair of raised opposed spaced shoulders formed at the respective opposed end portions of said bracket, and a resilient pickup arm mounted on said bracket for swinging movement in a lateral plane and having one end portion of said arm resting on and extending between said shoulders said end portion being formed with an aperture extending therethrough and the free end of said arm being adapted to carry a sound pickup unit, in combination with means for exerting a variable degree of downward pressure on the portion of said arm extending between said bracket shoulders to vary the pressure of the pickup unit needle on a record, said means comprising an

upwardly projecting screw-threaded member secured to the medial portion of said bracket and passing upwardly through said aperture formed in the pick-up arm, and a nut threaded on the upper end of said member to be screwed down to exert any desired degree of pressure on said pickup arm.

2. A pickup arm construction for phonographs comprising a mounting and adjusting bracket mounted for swinging movement in a lateral plane, a pair of raised opposed laterally spaced shoulders formed on said bracket, and a resiliently vertically bendable pickup arm mounted on and having its end portion extending between said shoulders, said end portion having an aperture disposed therethrough the free end of said arm being adapted to carry a sound pickup unit, in combination with means for exerting a variable degree of downward pressure on the portion of said arm extending between said bracket shoulders to vary the pressure of the pickup unit on a record, said means comprising an upwardly projecting screw-threaded member secured to the medial portion of said bracket and passing upwardly through said aperture in the pickup arm, and a nut threaded on the upper end of said member.

3. A pickup arm construction for phonographs comprising a mounting and adjusting bracket disposed for swinging movement in a lateral plane, a pair of raised opposed laterally spaced shoulders formed on said bracket, a resiliently vertically bendable pickup arm having one end portion disposed across said shoulders and formed with an aperture therethrough, the other end being adapted to carry a sound pickup unit in operative engagement with a record, in combination with means for varying the pressure of said pickup unit on the record comprising a screw-threaded member secured to said bracket and passing upwardly through the aperture formed in said arm, and a nut threaded on said member above said arm.

4. A pickup arm construction for phonographs comprising a mounting and adjusting bracket disposed for swinging movement in a lateral plane, a pair of raised opposed laterally spaced shoulders formed on said bracket, and a resiliently vertically bendable pickup arm having its end portion disposed across said shoulders, its other end being adapted to carry a sound pickup unit in operative engagement with a record, in combination with means for exerting a variable degree of downward pressure on said arm between said bracket shoulders to vary the pressure of the pickup unit on a record.

5. Mounting and adjusting means for a resilient pickup arm comprising a stationary base, a mounting and adjusting bracket mounted on said base for swinging movement in a lateral plane, and laterally spaced shoulders formed on said bracket and adapted to have the pickup arm extending thereacross, in combination with means carried by said bracket for exerting a variable amount of downward pressure on the portion of the pickup arm extending across said shoulders, comprising an upwardly disposed screw-threaded member secured to said bracket to extend above said pickup arm, and a nut threaded on said member to be turned into engagement with said pickup arm.

6. Mounting and adjusting means for a resilient pickup arm comprising a stationary base, a mounting and adjusting bracket mounted on said base for swinging movement in a lateral plane, and laterally spaced shoulders formed on said bracket and adapted to have the pickup arm extending thereacross, in combination with means carried by said bracket for exerting a variable amount of downward pressure on the portion of the pickup arm extending across said shoulders.

7. Mounting and adjusting means for a resilient pickup arm comprising a bracket mounted for swinging movement, a pair of raised spaced shoulders formed on said bracket and spaced apart in the plane of swinging movement thereof to have the pickup arm extending thereacross, in combination with means carried by said bracket for exerting a variable amount of pressure on the portion of said pickup arm extending between said shoulders.

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