

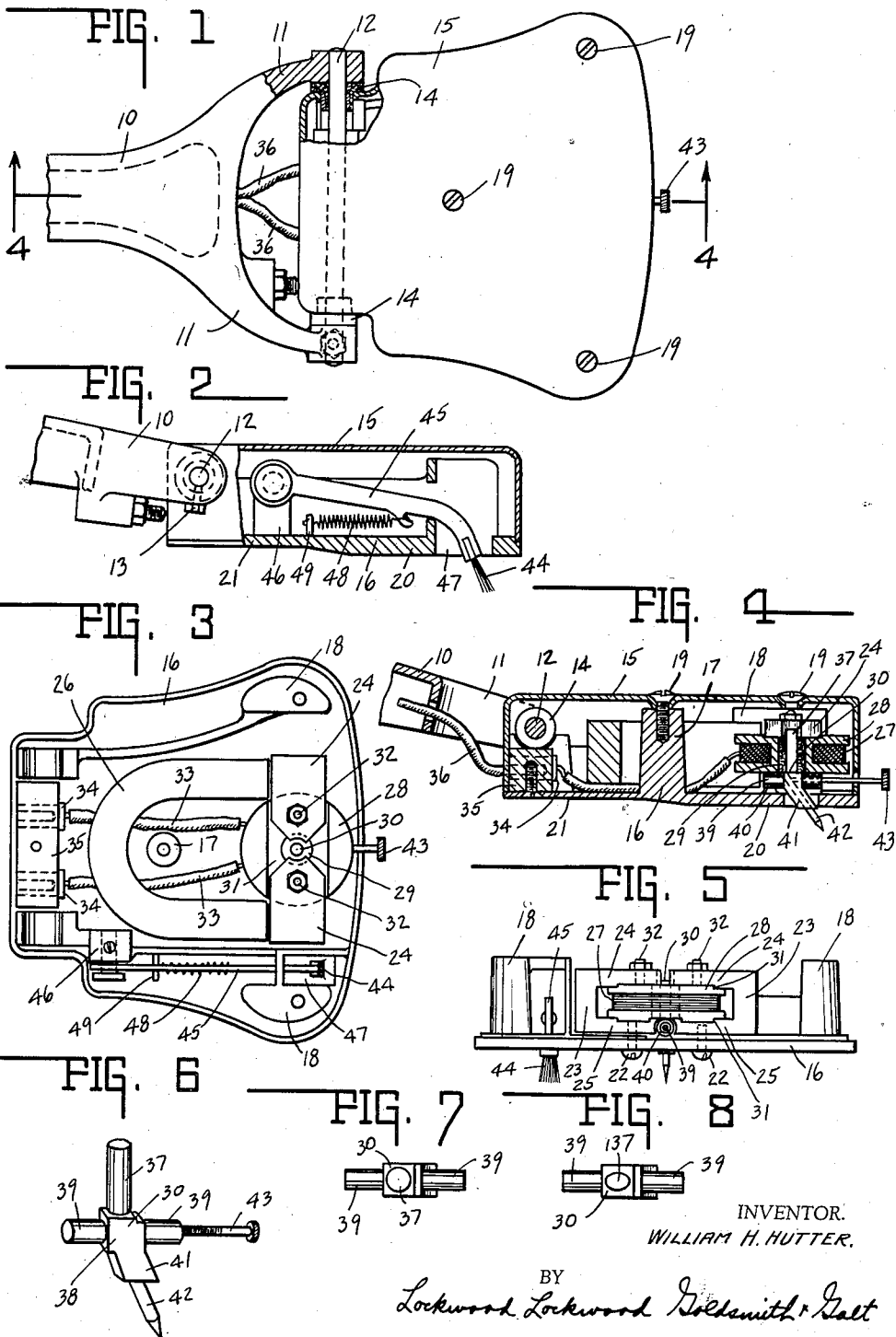
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PHONOGRAPH PICK-UP MECHANISM

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PHONOGRAPH PICK-UP MECHANISM

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This invention relates to phonograph pick-up mechanism. The principal object of the invention is to provide such mechanism in which extraneous noises are reduced as much as possible.

5 Another object of the invention is to provide an electromagnetic type of pick-up in which the vibration of the stylus has a maximum electrical effect upon the induced current in the pick-up coil.

10 A further object of the invention is to so form the parts that pick-up "talk" is greatly reduced.

Still another object of the invention is to provide such mechanism in which the magnetic pole pieces and pick-up coil may be placed in a horizontal position while the stylus is inclined at an angle to the horizontal.

One feature of the invention by which the extraneous noise is reduced resides in the provision of a pivotal and resilient mounting for the sound box upon the outer end of the pick-up arm. By this means, transmission of gear and motor vibrations from the phonograph to the pick-up mechanism contained in the sound box is substantially minimized.

25 Another feature of the invention by which the electrical effect of the stylus movement is increased resides in the provision of additional weight in the sound box itself to increase the inertia thereof and balance the same on the stylus. By this means, movement of the sound box itself, in response to movements of the stylus, is practically prevented so that the relative movement of the stylus and the magnetic parts carried by the sound box is greatly increased.

30 The effect of this feature is increased by the combination of the added weight with the resilient mounting of the sound box.

The electrical sensitivity is increased by the provision of a movable armature, the upper end of which is below the level of the upper surface of the magnetized pole pieces cooperating therewith. A large proportion of the magnetic flux passing from the pole pieces to the armature thus enters the upper surface of the armature instead of the sides. Small movements of the armature then result in greater variation of the current in the pick-up coil.

40 The pick-up talk is reduced by the provision of an armature whose moving portion is of a cross section shaped to minimize air disturbances. In the usual form of armature now in use, the portion thereof cooperating with the pole pieces is made flat and very thin. The longest dimension is transverse to the direction of movement of the armature and, therefore, sets up air vi-

brations which result in an appreciable sound in the sound box itself. This sound is known as "pick-up talk" and is audible when the amplification mechanism of the phonograph is disconnected. When the armature is round or stream-lined in form, as in the present invention, these air vibrations are minimized.

Other objects and features of the invention will be apparent from the accompanying drawing and the following description and claims:

Figure 1 is a plan view partly in section of the sound box attached to the end of the pick-up arm and illustrates the pivotal and resilient mounting thereof. Figure 2 is an elevational view of the same partly in section illustrating particularly the mechanism for cleaning the record. Figure 3 is a plan view of the sound box with the cover removed. Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 1. Figure 5 is an end view of the sound box with the cover removed. Figure 6 is a perspective view of the armature and stylus carried thereby. Figure 7 is a plan view of the top of the said armature in one form and Figure 8 is a similar view of an alternative form thereof.

In the drawing, the outer end of the pick-up arm of a phonograph is indicated by the numeral 10. The said pick-up arm is of a forked construction, best shown in Figure 1, having arms 11 by which there is fixedly carried a substantially horizontal pivot pin 12. The said pivot pin is maintained in place by a set screw 13. At each end of the pivot pin 12 adjacent the arms 11, there is provided a bushing 14 of rubber or other resilient material. The said bushings are engaged in suitable openings in a cover 15 of the sound box. The said cover is thereby pivotally and resiliently mounted upon the pivot pin 12.

The sound box is provided with a base member 16 having an upwardly-extending central lug 17 and a pair of lugs 18 positioned near the corners of the front edge. Screws 19 pass through suitable openings in the cover 15 and are threadedly engaged with the lugs 17 and 18 to support the base member and parts carried thereby. As will be seen particularly in Figure 3, the lugs 18 are much larger than necessary to accommodate the screws 19. The lugs thus serve to increase the inertia of the forward part of the base member 16 for the purpose hereinbefore described. It will also be seen, with particular reference to Figures 2 and 4, that the forward end 20 of the base member is made con-

siderably thicker than the rearward end 21 thereof. The increased thickness of the forward end also contributes to the increase of inertia of that part of the sound box adjacent the movable

armature hereinafter particularly pointed out.

Adjacent the front edge of the sound box and mounted upon the base member 16 by means of screws 22 there are a pair of pole pieces 23 each having an upper portion 24 and a lower portion 25. The said pole pieces are magnetized by a horseshoe magnet 26 abutting against the same. Between the upper and lower portions of the pole pieces 23 there is positioned a pick-up coil 27 mounted upon a spool 28. In the center of the spool 28 there is provided a bushing 29 of rubber or other resilient material and the said bushing resiliently holds the upper end of an armature 30. The upper and lower surfaces of the spool 28 are provided with slotted grooves 31 in which the upper and lower portions of the pole pieces 20 are engaged. The said spool may, therefore, be slidably moved with respect to the said pole pieces to adjust the relative position of the pole pieces and armature. When the proper position is obtained, the spool is fastened in place by means of set screws 32. The pick-up coil 27 is connected by electrical leads 33 to terminals 34 carried by a terminal block 35 mounted at the rear edge of the sound box. Terminals 34 have attached thereto leads 36 passing upwardly and through the pick-up arm and connected to suitable amplification apparatus.

The armature 30 consists of an upper portion 37 substantially cylindrical in form and extending, as best shown in Figure 4, to a level slightly below the upper level of the upper portion of the pole pieces 23. Beneath the portion 37 of the armature there is formed a rectangular portion 38 carrying cylindrical arms 39 which are surrounded by resilient bushings 40 and clamped between the lower portions 25 of the pole pieces 23. Beneath the rectangular portion 38 there is provided a portion 41 extending downwardly at an acute angle to the horizontal and the said portion 41 is provided with a suitable opening for the reception of a stylus 42. The said stylus is clamped in place by means of a screw 43 engaging a suitable threaded opening in one of the arms 39. By this construction of the armature, it will be seen that the upper surface has a substantial area for the reception of magnetic flux from the pole pieces 24 and that the location of the same beneath the upper surface of the said pole pieces provides for the entrance of magnetic flux thereto. With this arrangement of the armature and pole pieces, the change of flux due to movement of the stylus and armature is much greater than with types of armature previously used. It will also be seen that the cylindrical portion 37 will cause much less disturbance of the air surrounding the same and, therefore, reduces "pick-up talk." This effect is even more pronounced when the upper portion of the armature is formed with a stream-line cross section as shown at 137 in Figure 8. It will also be seen that the provision of the inclined portion 41 permits the stylus to project at the proper angle to engage the record while

the pole pieces and pick-up coil are in a substantially horizontal plane. The sound box as a whole, therefore, occupies much less space in a vertical direction.

For cleaning a record as it is played and drawing the stylus into the groove, there is provided a brush 44 mounted on the end of an arm 45 which is pivotally carried upon a lug 46 formed upon the base member 16 and which projects downwardly through an opening 47 in the said base member. The said arm is engaged by one end of a tension spring 48, the opposite end of which is fastened to an ear 49 formed on the base member 16. The said spring, therefore, serves to keep the brush 44 in contact with the record independently of the length of stylus employed.

The invention claimed is:

1. Phonograph mechanism having a pick-up arm, and an induction type sound box, characterized by weights carried by said sound box to increase the inertia and balance thereof, and a pivotal, resilient mounting for supporting said sound box upon said arm.

2. A phonograph sound box having a base portion, electromagnetic pick-up mechanism supported on said base, a resiliently-mounted armature and a stylus carried by said armature, characterized by means for pivotally and resiliently mounting said sound box upon the pick-up arm of a phonograph, and by weighted lugs formed on said base portion to increase the inertia and balance thereof.

3. Phonograph pick-up mechanism having a pair of magnetized pole pieces each having an upper and a lower portion, a pick-up coil spool mounted between the upper and lower portions of said pole pieces, and an armature mounted in the center of said spool, characterized by said spool being slidably mounted for adjustment on said pole pieces.

4. Phonograph pick-up mechanism having a pair of magnetized pole pieces each having an upper and a lower portion, a pick-up coil spool mounted between the upper and lower portions of said pole pieces, and an armature mounted in the center of said spool, characterized by the surface of said spool having a slotted recess engaged by said pole pieces for sliding adjustment.

5. Phonograph pick-up mechanism having a pair of magnetized pole pieces each having an upper and a lower portion, a pick-up coil spool mounted between the upper and lower portions of said pole pieces, and an armature mounted in the center of said spool, characterized by the upper and lower surfaces of said spool having slotted recesses therein engaged by said pole pieces for sliding adjustment.

6. A phonograph sound box having an electromagnetic pick-up mechanism, a housing enclosing said pick-up mechanism, said housing being formed with forwardly and laterally flared side walls substantially spaced from said mechanism to provide compartments on each side thereof, and a weighted lug mounted in each of said compartments laterally of said mechanism to increase the inertia and balance thereof.

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