

Jan. 28, 1930.

C. F. ROBINSON
ELECTROMAGNETIC DEVICE

1,744,922

Filed Sept. 25, 1928

Fig. 1.

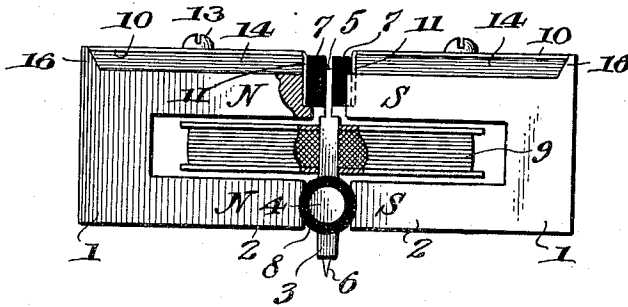


Fig. 2.

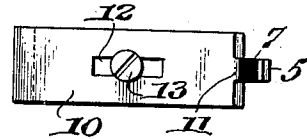


Fig. 3.

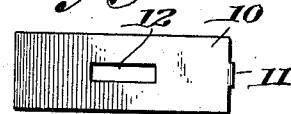


Fig. 4.

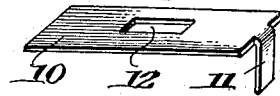


Fig. 5.

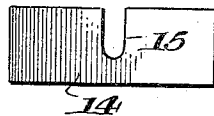


Fig. 6.

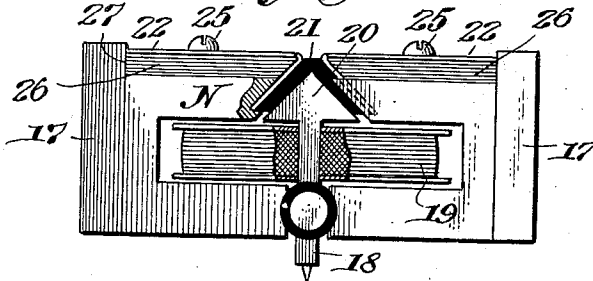


Fig. 7.



Fig. 8.

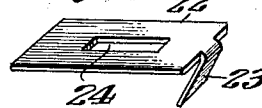


Fig. 9.

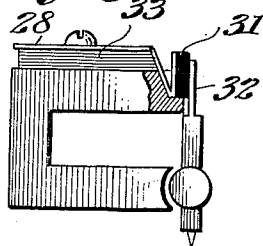
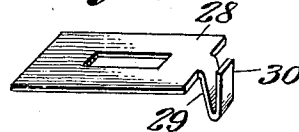


Fig. 10.



By

Inventor:
Clyde F. Robinson
Raymond Jones
Atty.

UNITED STATES PATENT OFFICE

CLYDE F. ROBINSON, OF MIAMI, OKLAHOMA

ELECTROMAGNETIC DEVICE

Application filed September 25, 1928. Serial No. 308,219.

My invention relates to electromagnetic devices commonly known in the art as magnetic pick-ups which are employed to produce in an electric circuit current variations which are proportional to and caused by vibrations of an armature located in a magnetic field, said vibrations in the present case being produced by the action of a sound record upon a needle carried by said armature.

More specifically, my invention relates to a means for adjusting the position of armatures in magnetic pick-ups and for varying the pressure of the usual rubber dampening pads upon the free end of such armatures.

A particular object of this invention is to provide an adjustment set forth which is very sensitive and micrometer like in action.

A further object is to provide an adjusting means which is positive in action and which is permanently maintained at any desired position to which it may be moved.

Another object is to provide an armature adjustment which can be easily adapted to existing types of magnetic pick-ups, and which is simple and effective in operation and economical to manufacture.

Other objects will become apparent from a reading of the specification which follows and from the accompanying drawings, wherein—

Figure 1 shows a side elevation of one form of the invention;

Fig. 2 is a top plan view of a portion of Fig. 1 showing a pole portion and a cooperating adjuster plate;

Figs. 3 and 4 show a plan view and an isometric view, respectively, of an adjuster plate;

Fig. 5 shows a preferred form of a removable shim which cooperates with an adjuster plate;

Fig. 6 shows a side elevation of another form of the invention;

Fig. 7 is a top plan view of a portion of Fig. 6, the adjuster plate being removed;

Fig. 8 shows a form of adjuster plate to be used with the device shown in Fig. 6;

Fig. 9 shows a third modification of the invention; and

Fig. 10 is a view in perspective of the adjuster plate shown in Fig. 9.

Referring to the drawings in detail, numeral 1 indicates the usual U-shaped permanent magnet and 2 the pole piece extensions thereon in common use in magnetic pick-ups. Numeral 3 indicates a soft iron armature pivotally mounted as at 4 and having an extension 5 at its upper end and the usual needle 6 at its lower end adapted to cooperate with a sound record. Dampening blocks 7 formed from rubber or the like are located in recesses in pole pieces N—S and contact on opposite sides of armature extension 5. A rubber dampening means 8 is arranged also to surround armature pivot 4.

Magnetic pick-up coil 9 is located between pole pieces N—S and surrounds armature 3. Coil 9 is in series with the closed pick-up circuit which includes the usual amplifying means. Vibrations of armature 3 cause variations in the magnetic flux in coil 9 thereby inducing a corresponding E. M. F. in coil 9.

The present invention relates to a novel means and method for adjusting the pressure on the dampening blocks 7. In Fig. 1, adjusting plates 10 are mounted on the pole pieces N—S and are provided with depending extensions 11 arranged to contact blocks 7. Slots 12 are formed in plate 10 and a screw 13 is passed through each slot and into the pole piece to secure each plate in any desired position. A series of shims 14 formed from paper or the like having slots 15 to accommodate screws 13 are located in stacked relation under each plate 10. The end of plate 10 opposite to the extension 11 contacts a beveled or cam surface 16 formed on the pole piece. The removal of one or more shims 14 followed by a tightening of screw 13 will permit plate 10 to move downwardly and in so doing, said plate will be caused to move inwardly toward blocks 7 due to the cam action of surface 16. It should be noted that the movement of plate 10 toward a block 7 is less than the distance that the plate moves downwardly. For example, the removal of a shim .01 inch in thickness will cause the plate to move inwardly .005 inch or less, depending upon the slope of surface 16. This

provides what might be called a micrometer adjustment of the plates 10 and resulting pressure on blocks 7 communicated by plate extensions 11.

5 In Fig. 6 is shown a magnet 17, armature 18, and coil 19. A wedge-shaped end 20 is formed on armature 18 and a rubber block 21 is located in recesses 21' in pole pieces N-S and of sufficient thickness to contact 10 wedge end 20. Adjuster plates 22 have an extension 23 at one end bent at an angle to the plate and a slot 24 is engaged by adjusting screws 25. Shims 26 are placed under each plate 22. One end of plates 22 contacts 15 a vertical face on magnet 17. The narrow plate extensions 23 are located in the pole recess in contact with block 21. It will be seen that the removal of one or more shims 26 will permit a plate 22 to be moved down- 20 wardly but the distance that an extension 23 moves toward a block 21 is less than the distance the plate moves downwardly and this results in a micrometer adjustment similar in result to that obtained by the means 25 shown in Fig. 1.

In Figs. 9 and 10 is shown a modified form of plate 28 which is provided with an extension 29 bent downwardly at an angle to the plate and re-bent vertically as at 30. The 30 angular portion 29 is located in an angular recess in the pole piece to slide along the sloping wall thereof, and the portion 30 contacts a rubber block 31 which lies adjacent to armature 32. Shims 33 are stacked under 35 plate 28 and the removal of one or more of these shims will permit plate 28 to move downwardly and the engagement of portion 29 with its corresponding angular pole recess wall will cause the plate to slide inwardly 40 against block 31 in much the same manner as obtained by the means shown in Fig. 1 and a micrometer adjustment is thereby obtained.

In the operation of the device, the pads 7, 21 or 31 function to smother out undesired 45 vibrations of the armature. The pressure of the rubber blocks upon the armature is varied by movement of the corresponding adjuster plates towards or from said blocks. The number of shims may be varied as desired 50 upon removal of the associated plate, and the plate is replaced in position and the adjusting screw is tightened, thereby causing the plates to move towards or away from the corresponding blocks. The position of the 55 armature with respect to the air gap can also be changed by moving one plate towards and the other plate away from the upper end of the armature.

The adjustment described is very sensitive 60 and effective. The movable parts thereof are easy to assemble and simple to operate. After a desired adjustment of the parts is made, there can be no further relative movement of these parts with the result that a perma- 65 nent adjustment is obtained.

While the novel adjustment is shown herein as applied to armatures for magnetic pick-ups, it is to be understood that this adjustment is adapted for use with armatures employed in other relations. It may be applied also to needle arms in general when the use of dampening means is effective for the purpose set forth. 70

It is intended that the scope of this invention is not limited to the disclosure in the accompanying drawings which are illustrative of modifications. 75

What I claim is:—

1. In a magnetic pick-up having magnetic poles and a movable armature, a dampening 80 member for said armature, means for adjusting the pressure of said member on said armature, said means comprising a plate for contacting said member, a plurality of shims for spacing said plate in relation to 85 said poles, said shims being removably mounted for adjusting the position of said plate in relation to said member, a cam face on each pole contacting said plate to determine its position with respect to said mem- 90 ber.

2. In a magnetic pick-up having a movable armature, a resilient dampening block in contact with said armature, a pole piece 95 adjacent said armature, an adjusting plate mounted on said pole piece and having a laterally bent extension in contact with said block, a plurality of removable shims for spacing said plate from said pole piece, said bent extension being movable toward said 100 block upon the removal of a shim, said movement of the extension being less than the thickness of the shim removed.

3. In a magnetic pick-up having poles and a movable armature, a resilient dampening 105 block in contact with said armature, an adjusting plate associated with said poles and said block, a plurality of removable shims for adjustably spacing said plate with respect to said poles and said block, and means 110 to limit the motion of said plate toward said block to an amount less than the thickness of the shim removed.

4. In a magnetic pick-up having poles and a movable armature, a resilient dampening 115 block in contact with said armature, adjusting plates mounted on said poles and having lateral extensions in contact with said block, and means for moving said plates towards or away from said poles in a direction at 120 right angles thereto and simultaneously moving said extensions towards or away from said block.

5. In an electromagnetic device, a vibrating armature and a support for said arma- 125 ture, yielding dampening means in contact with said armature, means for varying the pressure of said dampening means upon the armature, said last named means comprising an adjusting plate contacting said damp- 130

ening means, a plurality of removable shims for spacing said plate in relation to said support and said dampening means, and means to cause one end of said plate to move toward said dampening means during adjustment of the plate toward said support.

piece, a portion of said plate contacting said angular portion during adjustment of the plate to determine the position of the latter with respect to said block and armature.

In testimony whereof I affix my signature. 70

CLYDE F. ROBINSON.

6. In an electromagnetic device, a vibrating armature and a support therefor, yielding means contacting said armature, an adjustable plate having a lateral extension co-operating with said yielding means, and means for simultaneously moving said plate towards said support and said extension towards said yielding means.

7. A phonograph device including a pivoted needle holder, a supporting frame for said holder, yielding dampening means in contact with said holder, an adjusting plate mounted on said support in contact with said means, a plurality of removable shims arranged to space said plate from said frame, and means to slide said plate toward said means upon removal of a shim, and movement of the plate toward said frame.

8. In a magnetic pickup having pole pieces and a movable armature, a resilient dampening block in contact with said armature, said pole pieces having a surface portion inclined at an angle to a vertical side of said block, an adjusting plate in contact with said portion and said block, and means to permit said plate to assume various positions on said portion whereby said plate is moved relative to said block.

9. In a magnetic pickup having pole pieces and a movable armature, a resilient dampening block in contact with said armature, said pole pieces having a surface portion inclined at an angle to a vertical side of said block, an adjusting plate in contact with said portion and said block, and means to permit said plate to assume various positions on said portion whereby said plate is moved relative to said block, said means comprising a plurality of removable shims arranged between said plate and another surface portion of the associated pole piece.

10. In a magnetic pickup, a pole piece, a movable armature, a resilient dampening block in contact with said armature, said pole piece having a main supporting face and a surface portion at an angle to said face, an adjusting plate having contact with said block and with said surface portion, and means to move said plate along said surface portion for adjustment of the plate relative to said block.

11. In a magnetic pickup, a pole piece, a movable armature, a resilient dampening block in contact with said armature, an adjusting plate mounted on said pole piece in contact with said block, means to adjust said plate bodily towards or away from said pole piece in a direction at right angles to the latter, an angular face portion on said pole

75

80

85

90

95

100

105

110

115

120

125

130