March 19, 1935. E. C. GUEDON 1,995,177

ELECTROMAGNETIC PICK-UP DEVICE

Filed Dec. 10, 1932

Fig. 1.

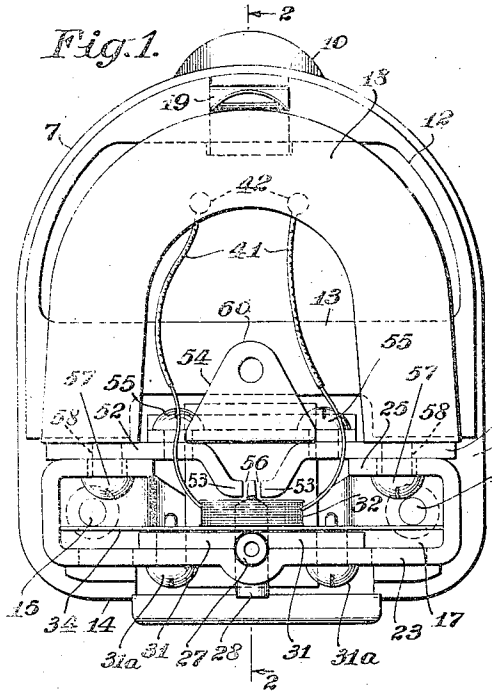


Fig. 2.

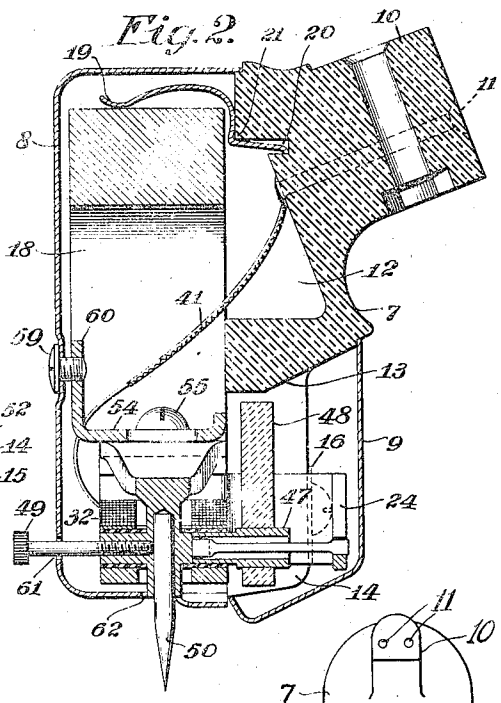


Fig. 3.

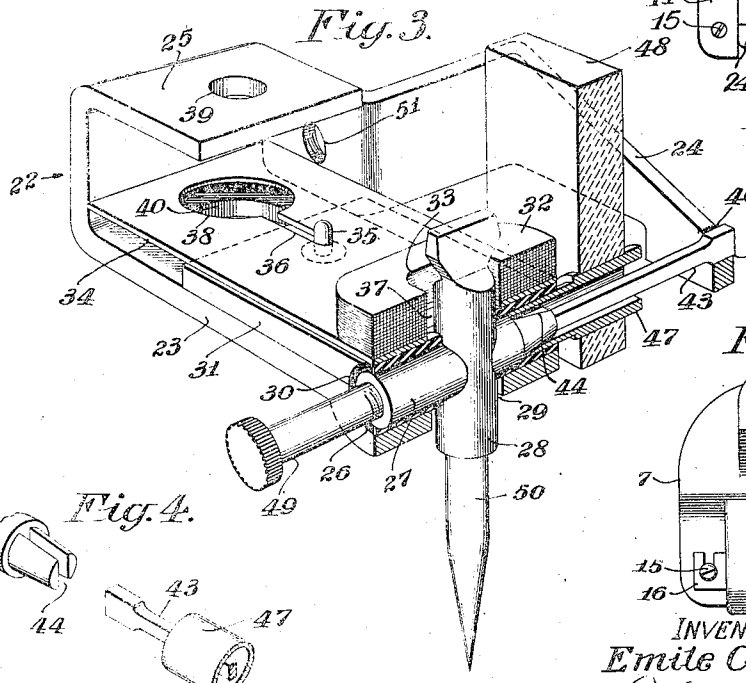


Fig. 4.

Fig. 6.

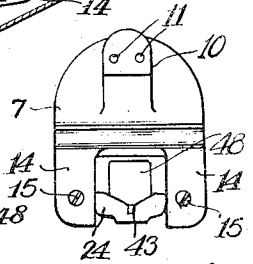
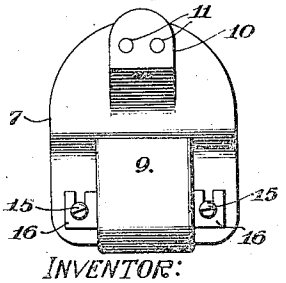


Fig. 5.



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ELECTROMAGNETIC PICK UP DEVICE

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Application December 10, 1932, Serial No. 646,609

16 Claims. (Cl. 179—100.41)

The present invention relates to electromagnetic pickup devices of the type employed in phonograph recording and reproducing systems, and has for its object to provide an improved and simplified construction in a device of that character, whereby the operating elements thereof may be more rapidly and easily assembled and adjusted in predetermined relation to each other, without impairing the operating characteristics of the device, than has heretofore been possible in like devices.

An electromagnetic pickup device of the type above referred to may be said, generally, to comprise a pivoted armature associated with an electrical winding or coil, and mounted between two magnetic pole pieces in a casing adapted to be carried on the end of a suspension arm, the armature forming or being provided with a stylus means for engaging the groove of a sound record. The device further includes a magnet, usually of the permanent type, a suitable detachable cover for the mechanism, and electrical terminal means for the winding or coil, usually molded in a base plate forming part of the casing.

There are several important details of construction which must be considered in the design of an electromagnetic pickup device, among which may be mentioned the provision of a simple, substantially frictionless pivot bearing means for the armature, a rigid supporting frame for the armature and magnetic circuit means, and an accurately adjustable and definite air gap for the armature. The device should, furthermore, be of light weight, and preferably be of relatively small size.

There must also be considered the problem of manufacturing and assembling the various elements of an electro-magnetic pickup device in accordance with modern production methods with unskilled labor, and for this reason, in addition to the foregoing points to be considered, various parts for best results and low cost of production must be adapted to be easily assembled and accurately adjusted without the exercise of more than ordinary care.

To the end that the manufacture and assembly may be facilitated, it is a further object of the present invention to provide a unitary operating mechanism which may be assembled from sub-assembly groups and which may be complete in itself as a unit apart from the casing, electromagnet and other elements of the pickup device, adjusted, and ready to operate when placed in the casing, or mounted in place in the final assembly of the device.

The invention will, however, be better understood from the following description when considered in connection with the accompanying drawing, and its scope will be pointed out in the appended claims.

In the drawing, Fig. 1 is a front view on a greatly enlarged scale, of an electromagnetic pickup device embodying the invention, with a cover removed to expose the interior mechanism;

Fig. 2 is a cross-sectional view of the device shown in Fig. 1, taken on line 2—2 and with the cover in place;

Fig. 3 is a cross-sectional view in perspective, on a still further enlarged scale, of a portion of the device shown in Figs. 1 and 2, showing certain details of assembly and construction;

Fig. 4 is a view in perspective, on the same scale as Fig. 3, of a detail of construction of certain parts shown in the preceding figures but in exploded relation to each other;

Fig. 5 is a rear view, substantially full size, of the device shown in Figs. 1 and 2, with a rear cover plate in place; and Fig. 6 is the same as Fig. 5, on a reduced scale, showing the cover plate removed.

Referring to the drawing, 7 is a molded composition base of insulating material adapted to receive front and rear cover plates 8 and 9 to form therewith a housing or casing, of smooth and pleasing exterior appearance, for the magnet and the operating mechanism hereinafter described. The base plate is provided with the usual rear extension or shank 10 for mechanical connection with a suspension means (not shown), and embedded therein are the usual electrical terminal means 11 for the device.

It will further be noted that the composition base 7 is deeply recessed in an interior face as indicated at 12, and is slotted or bifurcated at its lower end as shown in the drawing, to form a rigid bridge wall 13 connecting two depending leg portions 14 (Fig. 6). With this construction the interior mechanism may extend to the rear, between the leg portions 14 and within the confines of the cover plate 9, to render the device more compact. In effect, the rear wall of the casing is slotted at the lower end to permit the interior mechanism to project through the casing wall and exteriorly thereof.

Since the composition base is necessarily of appreciable thickness to provide mechanical strength, the above described arrangement results in a saving of space from front to rear over that construction in which the entire interior mechanism is mounted wholly within the casing

and on a solid base plate or the like. This construction, furthermore, results in a decrease in the weight of the device because of the reduction in the quantity of material required for the base plate, both by reason of the recess 12 and the slotted end, as above described.

The cover plate 9 for the protruding mechanism is of thin sheet metal or similar material adapted to protect the mechanism and to provide protection with light weight. It is held in place by means of two screws 15—15, secured to the base as hereinafter described, and which are clamped down upon slotted ears 16—16 carried by the cover plate 9 on opposite sides thereof.

The interior mechanism of the pickup device may be considered as divided into two main elements, namely, a unitary assembly which may be designated as the operating mechanism and indicated in Fig. 1 generally at 17, secured to the base plate 7 by the same screws 15, which are used to lock the cover plate 9 in place on the exterior, and a detachable U-shaped permanent magnet 18 of relatively large cross section and of short length detachably mounted on the operating mechanism and held in place thereon by a spring member 19. The latter engages the bowed center portion of the magnet and at its opposite end lies in locking engagement with the base plate, through the medium of a central slot 20 in the rear wall of the recess 12 and a shoulder 21 formed above the recess 12, as shown more clearly in Fig. 2. The spring is readily removable from the slot when the magnet 18 is removed.

By this arrangement, it will be seen that the operating mechanism 17 may be loosely mounted on the base plate 7 by means of the screws 15, for the cover plate 9, and firmly tightened against and secured to the base plate 7 when the screws 15 are locked in place against the ears 16 of the cover plate, since the frame is the only portion of the interior mechanism which is thus secured to the base plate. The spring action of the flat spring member 19 serves to hold the magnet 18 seated at its ends on the operating mechanism and yet permits the magnet to move with the latter slightly as the screws 15 are given the final tightening operation, or loosened slightly to remove the cover plate 9. This arrangement has the further advantage that the pickup device may be assembled from or disassembled into three main units, namely, the base plate, the operating mechanism, and the magnet. The whole assembly is thus held together by the two screws 15 and the spring member 19.

The operating mechanism or unit is, in turn, for manufacturing and assembly reasons, divided into two main groups or units which may be termed an armature assembly unit or armature unit, as shown in Fig. 3, and a pole piece assembly unit or pole piece unit, which forms the remainder of the above named unit 17 or operating mechanism.

Referring more particularly to Fig. 3, the armature assembly unit comprises a light weight unitary frame or supporting member indicated generally at 22, and providing a bearing plate 23, a spaced bracket member 24, and two spaced and elevated, coplanar supporting pads 25 for the remainder of the operating mechanism or pole piece assembly unit above referred to and hereinafter described.

The frame or supporting member is of magnetic material, such as steel, and is preferably formed in one piece as shown, from a comparatively thin sheet of such material. It is substantially in the form of a closed rectangle having elongated sides and short ends, with one side open to provide the spaced coplanar supporting pads 25 and with the opposite side or bearing plate 23 centrally upset or deformed transversely to provide a longitudinal groove 26. The groove forms a part of the bearing means for a pivot shaft 27 of a vibratory armature 28 which extends through an opening 29 in the frame at substantially a right angle to the bearing plate 23.

The armature pivot shaft extends on opposite sides of the armature and lies in the channel or groove 26 surrounded by sleeves 30 of rubber or other suitable material which will provide substantially a frictionless bearing means. The bearing means is completed by a clamping plate 31—31 comprising, in the present example, two opposed members which are bevelled to engage the rubber sleeves on opposite sides thereof and which are secured in engagement with said sleeves by suitable means, such as a pair of clamping screws 31*a* extending through the bearing plate 23 of the frame into said plates.

It will be noted that a single screw is employed to hold each plate in engagement with the rubber sleeves to substantially, completely surround the sleeves by supporting means. By this arrangement, the pivot bearing for the armature is rigidly held to a fixed axis and is given a uniform pressure throughout its length because of the ability of the plates to shift slightly about the axis of the screws 31*a* to conform to the rubber sleeves and exert thereon a uniform pressure.

Surrounding the armature 28 is the electric pickup coil or winding 32 in the form of a flat torus, the central opening 33 in which is of such dimensions that it provides a clearance space about the armature, and is maintained uniformly out of contact with the armature by a flat mounting strip 34 to which the coil 32 is secured.

The mounting strip is preferably of thin sheet insulating material of a length such that it lies between the ends of the unitary frame 22, as shown in Figs. 1 and 3, and within the confines of the frame, whereby it is prevented from transverse movement.

The strip is prevented from longitudinal movement, that is, movement in an axial direction with respect to the armature shaft 27, by integral pins 35 formed on the ends of the clamping plate screws 31a projecting upwardly, each through an elongated slot 36 in the strip 34. The slots 36 are stamped in the material of the strip together with a central opening 37 coresponding to the central opening 33 in the coil 32 and clearance openings 38 for permitting an assembly operation and adjustment of the air gap hereinafter described.

Briefly, however, it may be said that the openings 38 are arranged in alignment axially with an opening 39 in each pad 25 of the unitary frame and with an enlarged opening 40 in the bearing plate 23, also in alignment axially with the opening 39, whereby a screw driver or other instrument may be inserted through the openings 40 and 38 to engage a locking member which is employed in the opening 39 and hereinafter described.

From the foregoing description it will be seen that a coil may be mounted in place about the armature without tools or fastening means. The coil and its mounting strip are secured against movement in a transverse or longitudinal direction as soon as the strip is in place within the confines of the frame and in engagement with the locking pins 35. The coil is thereby pre-

vented from contacting with the armature and is held against vertical movement by means hereinafter described, when the assembly is completed. The insulated leads from the coil, indicated at 41, are connected with the inner ends of the terminal members 11 as indicated at 42, by soldering or by other suitable means.

The armature assembly unit or armature unit further includes a torsional spring member in the form of an elongated bar 43 connected with one end of the armature shaft 27 and with a central portion of the bracket member 24 of the frame, as shown more clearly in Figs. 2 and 3.

The purpose of the torsional spring member 43 is to hold the armature in a normal, neutral, vertical position, and to give it resiliency and to provide a restoring force when it is actuated in the translating operation. For this reason, the bar or spring member 43 is rigidly connected with the armature shaft and with the frame 24 and, in the present example, is of rectangular cross-section and mounted in slots 44 and 45 in the armature shaft and bracket member respectively.

This arrangement facilitates manufacture and assembly since the spring member 43 may be made of a simple rectangular section from flat bar stock, preferably of steel, and may be dropped into place in the slots upon assembly. The union between the frame 24 and the bar in the slot 45 is completed preferably by crimping of the metal or by fusion or soldering, as indicated at 46, along the joints between the bar and the frame, the solder fluxing with a coating which has been previously placed upon the various parts of the assembly.

The joint between the spring member 43 and the armature shaft 27 in the slot 44 is completed and made permanently secure by a sleeve 47 which is forced upon the end of the shaft, as shown more clearly in Figs. 3 and 4. It will be noted in Fig. 4 that the end of the shaft is tapered to receive the sleeve 47. The joint may be further secured by placing solder in the joint previous to the assembly and then heating the sleeve, although this is not entirely necessary if the sleeve is provided with a drive fit on the end of the shaft 27.

In the assembly operation, the sleeve is placed around the spring bar 43 as the latter is dropped in place and the sleeve 47 is then forced into the rubber sleeve 30 and about the end of the shaft by a driving operation. It will thus be seen that the assembly may be quickly effected and finally completed by locking the end of the spring bar 43 in the slot 45 in the bracket member 24.

The sleeve 47 also carries a freely movable block of damping material 48 which is forced onto the sleeve also prior to the assembly operation above described and secured to the sleeve by friction, supplemented by fusion incident to the heating operation in connection with the sleeve 47. The block is of inert material having no appreciable elasticity and may be in the nature of a material known as Du Pont viscoloid.

It will be noted that the block of damping material is so arranged that it is movable with the armature within a free space bounded by the arms of the bracket member 24 of the unitary frame, and lies below the bridge wall 13 of the base plate and between the depending leg portions 14 thereof, whereby it is protected against mechanical injury and yet it is in a position whereby it may be easily inspected by removal of the rear cover plate 9. In fact, the whole assembly of the torsional spring member, sleeve, and damping block 48 may be inspected from the rear without dis-assembling the pickup device, by merely removing the cover plate 9, thereby improving the accessibility of the various parts of the device.

The armature assembly unit is completed by a stylus clamping thumb screw 49 threaded axially to the opposite end of the armature shaft 27 from the connection with the spring member 43. This is arranged so that the thumb screw is presented frontally of the pickup device and serves to clamp within the hollow center of the armature a suitable stylus member 50 as shown in Figs. 2 and 3 more particularly. The stylus member 50, of course, is not mounted in the device during the assembly operation, but is used only when the device is placed in operation, as is well known. Also, the clamping screw 49 is not mounted in place until after the final assembly operation with the cover 8 in place, as shown in Fig. 2. This will hereinafter be more fully described.

From the foregoing description it will be seen that the armature assembly unit comprises the unitary frame member 22, providing a bearing plate 23, a rear bracket member 24, mounting pads 25, and a bearing groove 26 in the bearing plate. It further includes the armature mounted on the bearing plate in rubber sleeves 30 and clamped in place by clamping plates 31, a coil unit surrounding the armature, the damping block 48, and the spring connection 43, all of which are adapted to be assembled rapidly and easily and provided for further assembly in the apparatus as a complete unit.

This armature unit is assembled on the base plate 7 by the two screws 15 being inserted through suitable openings in the depending leg portions of the base plate and entering threaded openings 51 in the unitary frame 22, the frame being drawn to a seated position about the threaded openings 51 and against the base plate leg portions 14, and the final tightening operation being completed when the rear cover plate is in place on the leg portions 14 under the screw heads, as hereinbefore described.

In addition to the armature unit, the operating mechanism further includes the pole piece assembly unit or pole piece unit hereinbefore referred to. This comprises two pole pieces 52—52 arranged to lie upon the mounting pads 25 as shown in Figs. 1 and 2, and to provide depending opposed pole tips 53 on either side of the armature, as shown in Fig. 1. The pole pieces are of magnetic material and are joined by a transverse bridge member 54 of non-magnetic material, such as brass, secured to them by suitable means such as screws 55, whereby the bridge member 54 and pole pieces 52 form a unitary assembly.

When assembling with the bridge member, the distance between the pole tips 53 is arranged to be such that a desired air gap between the pole tips and armature is obtained when the armature is centrally located between said pole tips. This arrangement of parts readily provides for easy manufacture and assembly with the desired air gap for the reason that the pole piece assembly may be constructed from parts which when united by the bridge member 54 and screws 55 provide a predetermined air gap between the pole pieces 53. This unitary assembly is then placed upon the mounting pads 25 and is moved as a unit transversely on the mounting pads until the air gap on each side of the armature is uniform and

equal between the armature and the pole tips, as shown more clearly in Fig. 1 at 56.

This adjustment is made permanent and the pole piece assembly is secured to the unitary frame of the armature unit by suitable clamping means such as screws 57 which pass upwardly through the openings 39 in the mounting pads 25 and are threaded in the tapped openings indicated at 58 in the pole pieces. The openings 39 are enlarged slightly over the diameter of the clamping screws whereby the lateral or transverse adjustment of the pole piece assembly may be made as hereinafter described. The arrangement is best understood from an inspection of Fig. 1.

It will be seen that the openings 38 and 40 in the coil mounting strip and in the frame bearing plate are provided for inserting a screw driver or other tool for clamping the screws 57 when the adjustment of the air gap is being made. Other suitable clamping means may be provided, but the screw arrangement shown is at present preferred, because of its simplicity. The removal of material in the form of openings 40 in the frame further serves to lighten the pickup assembly without reducing the flux carrying capacity below a desired predetermined minimum value.

From the foregoing description it will be seen that both the armature assembly and pole piece assembly of the interior operating mechanism of the pickup device may be manufactured as separate units and may be quickly and easily mounted in place in the pickup device in adjusted relation to each other without further detailed operations or without involving a high degree of skill on the part of workmen employed to produce such devices. In practice, the pole piece unit and the armature unit are assembled to provide the operating mechanism or unit complete before being mounted on the base plate. The interior assembly is then completed by charging the magnet 18 and slipping it onto the pole pieces as shown in Figs. 1 and 2, beneath the holding spring 19 which is inserted in the slot 20 just previous to mounting the magnet 18, all as hereinbefore described. The pickup device is then completed by mounting the rear cover plate 9 in place and tightening the screws 15. The front cover plate is then placed in position as shown more particularly in Fig. 2 and is secured in place by central clamping screw 59, which engages a threaded opening in a bracket member 60 provided integral with the bridge member 54 in a position to lie just beneath the cover plate 8 below the opening provided for the screw 59 therein.

The stylus clamping screw 49 is then inserted through a suitable opening 61 also in the front cover plate 8 in alignment with the axis of the armature shaft. The opening 61 is arranged to provide sufficient clearance for the stylus clamping screw so that the armature may operate without contact with the cover plate 8. To this end, also, it will be noted that the cover 8 is also provided with an enlarged clearance opening 62 adjacent to the stylus receiving end of the armature to provide an operating clearance opening for the lower end of the armature and stylus.

From the foregoing description it will be seen that an electromagnetic pickup device embodying the invention has the advantage that it comprises substantially but three main elements, namely, a casing, of which the major portion is the insulating base plate; an interior operating mechanism; and a magnet, all being easily separable and adapted to be easily assembled as units before final assembly.

The casing comprises a base plate so arranged that it permits the interior mechanism to extend through it, and having cover plates so arranged that the interior mechanism may be inspected at the front and at the rear without disassembling the entire device and merely by the removal of the suitable cover plate.

The magnet is held in place by a simple spring member which is secured to the base plate, thereby permitting the cover plates to be removed without losing the magnet from its position and without requiring other bolting or clamping means for the magnet, as has heretofore been provided in such devices.

It will be appreciated that this simple and effective holding means is desirable when it is considered that if a magnet is removed from its support on the pole piece, it loses at once, substantially one half its magnetic flux, which can be restored only by re-charging the magnet.

The operating mechanism is provided as a complete assembly unit easily mounted in the casing or on the base plate by two screws which, at the same time, serve to hold the rear cover plate. It is mounted on the base plate or may be removed therefrom merely by inserting and tightening or removing two screws.

In itself, the operating mechanism is divided into two sub-assembly units, each of which may be completed before assembly, if necessary in in different parts of a factory and may be brought together for assembly at any convenient point, being complete in themselves.

The two units referred to are the armature assembly unit and the pole piece assembly unit, each of which is easily assembled in itself by what may be considered to be merely dropping the parts in place and tightening certain clamping screws.

As is obvious from an inspection of the drawing, Figs. 1 and 2, the bearing plate 23 and the pole pieces 52 are relatively small in cross-section compared with that of the magnet 18. It is therefore obvious that of the flux which flows through the magnet, a part of that flux flows across the air gap and another part flows through the bearing plate, in substantially parallel paths. The length of the path through the bearing plate is greater than that through pole pieces, however, the path through the pole pieces includes the air gap, although relatively small with the armature inserted therein, increases the reluctance of the path.

The operation is such that the armature more closely approaches one pole piece or the other, thereby causing the flux normally flowing across the air gap to flow in part first downwardly and then upwardly through the armature and thereby inducing corresponding voltages in the coil which is cut by the flux as it changes from a downward to an upward flow in the armature. The reason for the flow reversing is because of the widening of the air gap on one side of the armature and the closing of the air gap on the other side of the armature as it vibrates in the air gap.

As the operation of magnetic armatures of this type is old and well understood, further description is believed to be unnecessary.

It will be seen that the various parts each cooperate to provide a simplified and improved light weight electromagnetic pickup device and to permit a relatively short armature to be utilized, which has the advantage of an improved fre-

quency response characteristic. The depending pole pieces 53 for meeting the short armature, as will be seen from Fig. 1, serve also to prevent upward movement of the coil 32. Thus the coil, while not secured rigidly in any direction, is, nevertheless, held in place and prevented from contacting with the armature by other elements of the assembly and without any particular holding means. Thus, throughout the entire assembly, it will be seen that a major portion of the parts are utilized for a dual function, thereby reducing the weight of the device and simplifying its manufacture and assembly.

I claim as my invention:

1. An electric phonograph pickup device including, in combination, a casing comprising a base member and two removable cover members on opposite sides thereof, and a unitary operating mechanism in the casing secured to the base member and extending therethrough into one of said cover members.

2. An electric phonograph pickup device including, in combination, a casing comprising a base member and two removable cover members on opposite sides thereof, and a unitary operating mechanism in the casing secured to the base member and extending therethrough into one of said cover members, said operating mechanism including an armature assembly unit having a pivoted armature, a pole piece assembly unit providing a fixed air gap, and means for adjustably securing said units together to center the armature in the air gap.

3. An electric phonograph pickup device including, in combination, a bifurcated base member and a unitary operating mechanism mounted thereon and extending in part therethrough between depending leg portions of said base member, said operating mechanism comprising an armature unit including a pivotally mounted armature, a pole piece unit providing a fixed air gap, and means for adjustably securing said units together in operative relation to each other to center said armature in the air gap.

4. An electro-magnetic pickup device including, in combination, an armature unit comprising a unitary frame providing a bearing plate, a bracket spaced axially from the bearing plate and two spaced co-planar supporting members on opposite sides of the bearing plate, an armature having a shaft pivotally mounted on said bearing plate and flexibly connected with said bracket, an electric pickup coil surrounding said armature, a second unit comprising two pole pieces secured to said supporting members and a bridge member by which said pole pieces are connected, said pole piece unit being adjustable with respect to the armature unit to center the armature in the air gap, and means for securing said units in adjusted relation to each other.

5. In an electric phonograph pickup device, the combination with a pivotally mounted armature, of a magnet element, unitary means for supporting said armature, and a second and separate unitary magnetic pole means for said magnet element providing a fixed air gap, said first and second named means being adjustable with respect to each other to center said armature in the air gap.

6. In an electric phonograph pickup device, the combination with a pivotally mounted armature, of a unitary frame means for supporting said armature, a second and separate unitary means providing a fixed air gap, said first and second named means being adjustable with respect to each other to center said armature in the air gap, means for securing said units together in adjusted relation, a base plate and covers providing a casing, means for securing said unitary frame means and one of said covers to the base plate, a magnet, and means independent of said covers for resiliently holding the magnet in contact with one of said units.

7. In an electric phonograph pickup device, an armature unit including, in combination, a pivotally mounted armature, an electric pickup coil surrounding said armature, a unitary frame member arranged to support said armature and said coil, means carried by the coil and means provided on the frame cooperating to hold said coil in adjusted position with respect to the armature, a torsional centering spring member extending from the armature into engagement with the frame member, and a pole piece unit mounted on and adjustably secured to the frame.

8. In an electric pickup device, an armature unit including, in combination, a pivotally mounted armature, an electric pickup coil surrounding said armature, a unitary frame member arranged to support said armature and said coil, means carried by the coil and means provided on the frame cooperating to hold said coil in adjusted position with respect to the armature, a torsional centering spring extending from the armature into engagement with the frame, a pole piece assembly unit comprising two pole pieces associated with said armature and a bridge member rigidly connecting said pole pieces, said last named unit being adjustably mounted on said armature unit, and means for securing said armature unit in said pickup device.

9. An electro-magnetic pickup device including, in combination, a recessed base plate having two depending spaced leg portions, an operating mechanism detachably secured to said leg portions and extending therebetween, a magnet member mounted on said operating mechanism to complete a magnetic circuit therethrough, and means for resiliently connecting the said magnet member to the base plate.

10. An electro-magnetic pickup device including, in combination, a recessed base plate having two depending spaced leg portions, an operating mechanism detachably secured to said leg portions and extending therebetween, a magnet member mounted on said operating mechanism to complete a magnetic circuit therethrough, means for resiliently connecting the said magnet member to the base plate, and detachable covers arranged to cooperate with the base plate to form a casing for said magnet and operating mechanism.

11. An electro-magnetic pickup device including, in combination, a recessed base plate having two depending spaced leg portions, an operating mechanism detachably secured to said leg portions and extending therebetween, a magnet member mounted on said operating mechanism to complete a magnetic circuit therethrough, and means for resiliently connecting the said magnet member to the base plate, said operating mechanism comprising a unitary frame member, an armature member pivotally mounted thereon, an electric pickup coil surrounding said armature, means carried by the coil engaging the frame to hold the coil in spaced relation to the armature, a block of vibration damping material connected with the armature and a torsional spring member connected between the armature and the frame, said elements of said mechanism being

adapted to be assembled as a unit, a pair of pole pieces and a bridge member therefor rigidly connecting said pole pieces mounted as a unit on said armature unit, said pole pieces having pole tips associated with said armature to provide an air gap therefor, and means for securing said pole piece unit and said armature unit together in adjusted relation to cause said air gap to be uniform about said armature.

12. In an electric pickup device, the combination of an armature having a shaft, a supporting frame for the armature adapted to provide a portion of a magnetic circuit, a torsional spring member extending axially of the armature shaft, said shaft and said frame being slotted to receive the ends of said spring member thereby to establish a connection between the armature shaft and the frame, said frame being substantially rectangular in form and having an open side, a pole piece assembly unit mounted on said open side and depending therein in association with the armature, said pole piece unit being adjustably mounted on said frame to provide a uniform air gap for the armature, a pickup coil surrounding said armature, and means carried by said coil and by said frame arranged to cooperate to hold said coil in spaced relation to said armature and in an adjusted operating position in association therewith.

13. In an electric pickup device, the combination with an armature member having a torsional centering spring connected therewith, of a pair of pole pieces having pole tips arranged in fixed spaced relation to each other to provide a fixed air gap, said pole pieces being rigidly connected together whereby they are removable as a unit to center the armature in the air gap, and a unitary frame member of sheet material in the form of an open rectangle providing a bearing plate for the armature, a bracket member for connection with the torsional centering spring and spaced co-planar supporting pads for the pole pieces, means providing a pair of studs in said frame, an electric pickup coil surrounding the armature, and a strip of insulating material secured to the pickup coil and arranged to lie in said frame in engagement with the ends thereof and with the studs to hold the pickup coil in fixed spaced relation to the armature.

14. An electric pickup device comprising an armature, a supporting frame therefor, an electric pickup coil surrounding the armature and a magnet having pole pieces associated with the armature characterized by the fact that the magnet is releasably mounted by spring means on the pole pieces, the pole pieces are rigidly connected together and adjustably mounted on the frame to center the armature in a fixed air gap provided between their pole tips, and that the pickup coil is removable from an operative position with respect to the armature when the pole pieces are removed from the frame.

15. An electric phonograph pickup device including, in combination, a casing comprising a base member and two removable cover members on opposite sides thereof, a pivotally mounted armature, a magnet element, unitary means for supporting said armature secured to said base member and extending therethrough into one of said cover members, and unitary magnetic pole means for said magnet element providing a fixed air gap, said armature supporting means and said unitary pole means being adjustable with respect to each other to center said armature in the air gap.

16. An electromagnetic pickup device including, in combination, a recessed base plate having two depending spaced leg portions, an operating mechanism secured to said leg portions and having a frame extending between said portions, a vibration damping block for said operating mechanism mounted between said leg portions in said operating mechanism, and a magnet member mounted on said operating mechanism and connected with said base plate.

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