

March 17, 1931.

H. P. DONLE

1,797,197

ELECTROMAGNETIC PICK-UP

Filed Oct. 29, 1928

Fig. 1.

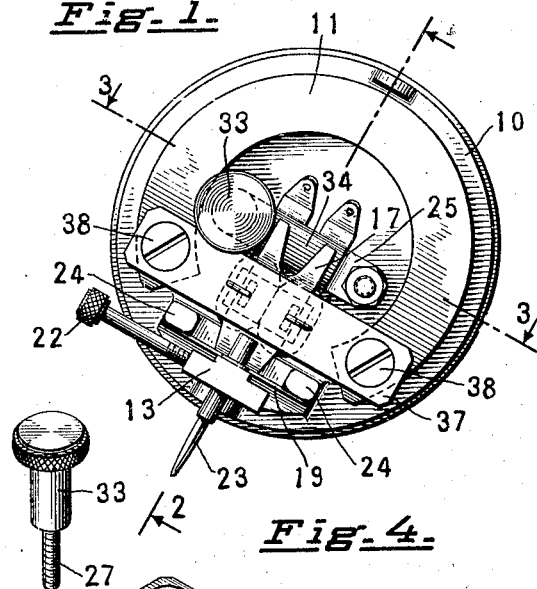


Fig. 2.

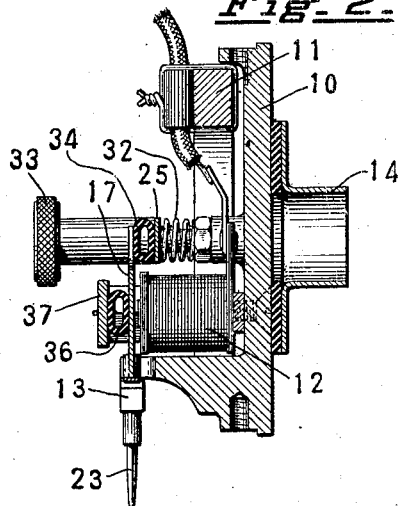


Fig. 4.

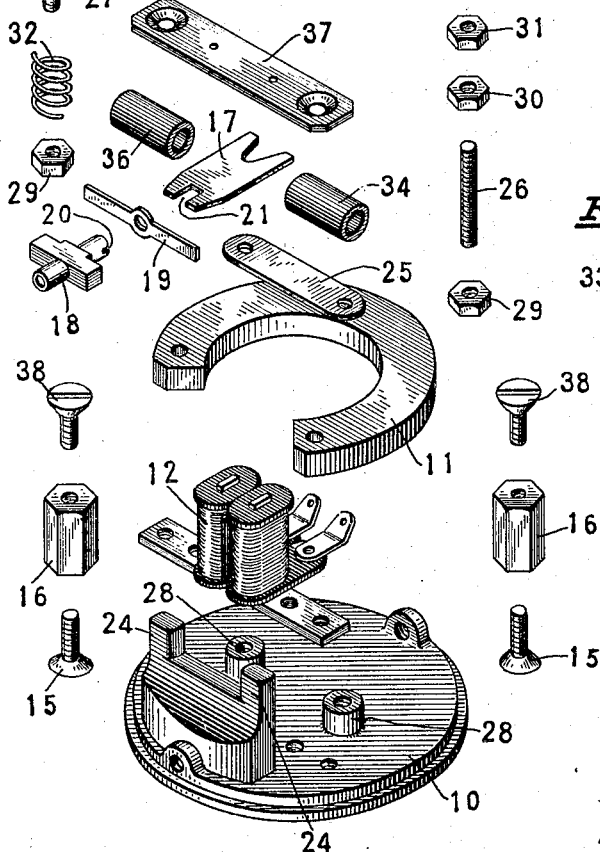


Fig. 5.

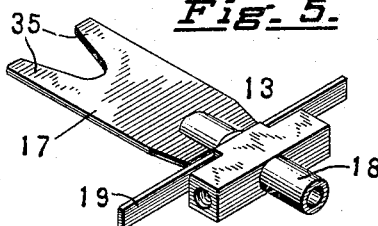
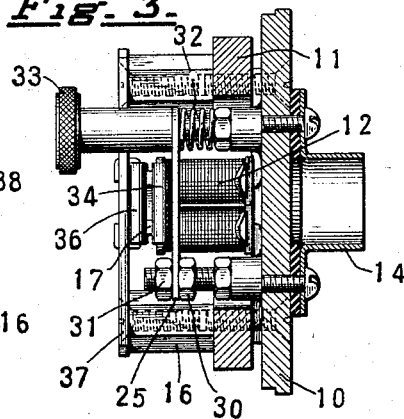


Fig. 3.



INVENTOR.

Harold Potter Donle,

BY

[Signature] ATTORNEY

UNITED STATES PATENT OFFICE

HAROLD P. DONLE, OF MERIDEN, CONNECTICUT, ASSIGNOR, BY MESNE ASSIGNMENTS,
TO RADIO INVENTIONS, INC., A CORPORATION OF NEW YORK

ELECTROMAGNETIC PICK-UP

Application filed October 29, 1928. Serial No. 315,803.

One object of my invention is to produce a simple but inexpensive form of construction which will faithfully transform the mechanical impressions of the sound record into electric pulsations suitable for amplification and reproduction. A special object is to produce a device of this character which will afford a maximum amplitude of reproduction of the desired sound record with a minimum amplification of the needle scratch.

In carrying out the invention I provide a suitable electro-magnetic system having a permanent magnet together with a coil winding or windings and an armature supported by a torsionable spring leaf and dampened by offset members so as to eliminate harmonics. To facilitate changes in the adjustment of the armature and stylus member I provide a single adjusting screw which is readily accessible while the device is in operation.

Fig. 1 is a front view of the principal parts of the apparatus but omitting the casing which would ordinarily be employed with such a device.

Fig. 2 is a sectional view on the plane of the line 2—2 of Fig. 1.

Fig. 3 is a sectional view on the plane of the line 3—3 of Fig. 1.

Fig. 4 is an exploded perspective view showing the principal parts of the device.

Fig. 5 is a perspective view of the armature and stylus carrier.

The base 10 may be made of a die casting and provided with supports for the various elements including the permanent magnet 11, the magnet core members 12 and the combined armature and stylus carrier 13. An extension 14 may also be secured to the face to facilitate attachment to a movable tone arm or the like.

The magnet 11 is suitably secured to the base as for instance by the screws 15 and the nuts 16. The feet of the L-shaped core mem-

bers 12 are clamped between the ends of the magnet and the base.

The armature and stylus member is made up of the armature proper 17, the stylus holder 18 and the spring 19. The stylus holder has a slotted extension 20 which is interlocked with a slot 21 at the end of the armature. The spring 19 is perforated and slipped over the end of the extension 20 and the parts soldered or brazed together. The clamp 22 screws into the holder 18 to engage the stylus 23. The ends of the spring 19 are soldered or otherwise suitably secured to the posts 24 which are formed integrally with the base and are quite rigid.

The cross piece 25 is supported on screw studs 26 and 27 which are screwed into the bosses 28 in the base and anchored by set nuts 29. One end of the cross piece 25 is held between two adjustable nuts 30 and 31 so that that end of the cross piece may be adjusted initially to the proper height. The other end of the cross piece 25 is pressed in one direction by the spring 32 against the adjusting thumb piece 33 so that the cross piece may be forced toward the base by the spring and will be forced away from the base by the spring when the screw is retracted. A soft rubber damper 34 is interposed between the cross piece 25 and the forked end 35 of the armature.

A second damping member 36 also preferably formed of soft rubber tubing is interposed between the armature and the cross piece 37 directly over the pole pieces of the magnet windings. The cross piece 37 is secured in place by screws 38 which screw into the upper end of the nut 16.

The parts are so designed and arranged that the principal part of the weight of the pick-up is sustained by the stylus through the spring 19 so that the parts are yieldingly supported by a spring capable of vibration in the direction of the axis of the stylus so that surface scratching has a minimum effect on

the device. The armature is of course designed to vibrate in a direction axial to the poles of the magnet. This vibration is permitted by the twisting of the spring 19. Harmonic vibration tending to destroy the faithfulness of reproduction are prevented by the two damping members 34 and 36 which are offset from each other so as to bind upon the armature not only in its outer forked end 35 but also at a point intermediate this end and the spring 19 which in effect pivotally supports the armature. The parts are initially adjusted to produce the most effective results but the position of the armature with respect to the pole pieces and the amount of damping may be readily adjusted by means of the check nuts 30 and 31 and the set screw 33. Normally the adjustment of the set screw 33 is sufficient and it is only intended that the nuts 30 and 31 shall be adjusted at the factory or in case of emergency. The spring support 19 for the stylus and armature avoids the objectionable bearings with movable parts which are likely to wear and get out of adjustment.

I claim:

1. An electro-magnetic pick-up comprising a supporting plate, a combined armature and stylus member, a spring supported by the plate and adapted to be vibrated torsionally and also toward and from a record surface, said armature and stylus member being carried by said spring, and an electro-magnetic system electrically responsive to the vibrations which move the armature member laterally and produce torsion of said spring but unresponsive to movements of the armature and stylus member toward and from the record.

2. An electro-magnetic pick-up comprising a supporting plate, a spring supported by the plate and adapted to be vibrated torsionally and also toward and from a record surface, a combined armature and stylus member carried by said spring, an electro-magnetic system including a magnet having a coil electrically responsive to the lateral vibrations which move the armature and produce torsion of the spring, but unresponsive to movements of the armature toward and from the record, and damping means independent of the supporting spring for acting upon the armature and stylus member.

3. An electro-magnetic pick-up comprising a base, a magnet having pole pieces secured thereto, supporting posts arranged near said pole pieces, a spring having its ends secured to said posts, an armature and stylus member secured to said spring, damping means for the opposite end of said armature and damping means arranged between the first damping means and said spring.

4. An electro-magnetic pick-up comprising a base having spaced posts at one edge and a pair of screw threaded studs near the center

of the base, an armature having one end pivotally carried by said posts, a cross piece carried by said studs, a damping member between said cross piece and the opposite end of said armature, means for adjusting said cross piece, an electro-magnet having a pole piece between said posts and said studs and co-acting with said armature and a damping member for said armature arranged opposite said pole piece.

5. An electro-magnetic pick-up comprising a base having posts, an armature pivotally supported by said posts, an electro-magnet having a pole piece coacting with said armature, screw studs carried by said base, a cross piece carried by said studs and adjustable thereon, a damping member arranged between said cross piece and one end of said armature, a spring on one of said studs pressing said cross piece in one direction and a thumb screw coacting with said stud to move said cross piece in opposition to said spring.

6. An electro-magnetic pick-up comprising a base having spaced posts at one edge and a pair of screw threaded studs, an armature, a leaf spring having its center connected to said armature and its ends carried by said posts, a cross piece adjustably carried by said studs, a yielding damping member between said cross piece and said armature, means for adjusting said cross piece, an electro-magnet having a pole piece between said posts and said studs and coacting with said armature and a damping member for said armature arranged opposite said pole piece and offset from the other damping member.

7. An electro-magnetic pick-up comprising a base, a magnet having pole pieces secured thereto, supporting posts arranged alongside of said pole pieces, a spring having its ends secured to said posts, an armature and stylus member secured to said spring, damping means for the opposite end of said armature and damping means arranged between the first damping means and said spring and a single screw for adjusting the damping action.

8. An electro-magnetic pick-up comprising a base having a magnetic system including pole pieces, an armature and stylus supported by a leaf spring at one side of the pole pieces, said leaf spring being arranged to permit vibration of the stylus vertically adjustable damping means at the other side of the pole pieces and damping means arranged over the pole pieces.

9. An electro-magnetic pick-up comprising a base having posts, a leaf spring carried thereby, an armature pivotally supported by said spring, an electro-magnet having a pole piece coacting with said armature, studs carried by said base, a cross piece carried by said studs and adjustable thereon, a damping member arranged between said cross piece

and one end of said armature, a spring on one of said studs pressing said cross piece in one direction and a thumb screw coacting with said stud to move said cross piece in opposition to said spring.

10. An electro-magnetic pick-up comprising a base, a magnet having pole pieces secured thereto, a spring supported by said base, an armature and stylus member secured to said spring, damping means for the end of said member remote from said stylus and supplemental damping means arranged between said first damping means and said spring, both of said damping means being arranged to act upon said integral member.

HAROLD P. DONLE.

20

25

30

35

40

45

50

55

60

65