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H. P. DONLE

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ELECTRIC PICKUP

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Fig. 1.

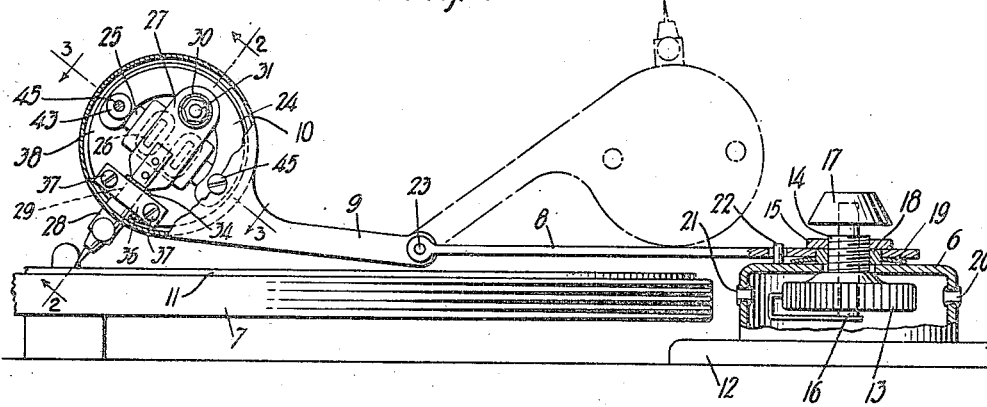


Fig. 5.

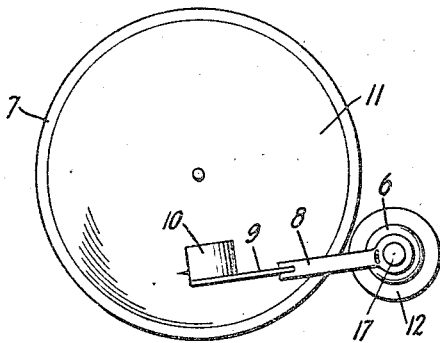


Fig. 2.

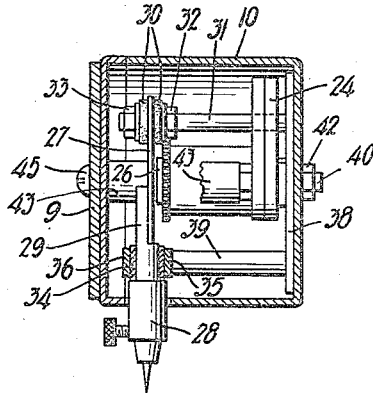


Fig. 3.

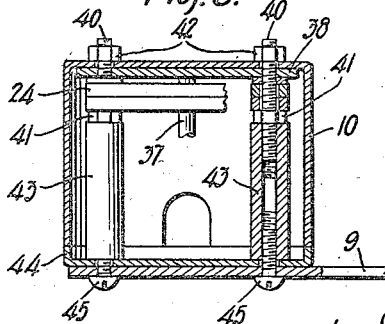
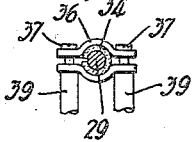


Fig. 4.



Inventor

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by *[Signature]* - Atty

# UNITED STATES PATENT OFFICE

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TO RADIO INVENTIONS, INC., A CORPORATION OF NEW YORK

## ELECTRIC PICKUP

Application filed November 5, 1928. Serial No. 143,459.

My invention relates to mechanism for the reproduction of sound and particularly to a device for reproducing sounds recorded on wax records and the like and transmitting them electrically to a distance and usually amplifying them.

One object is to provide a device which is simple and reliable, easily adjusted and capable of faithful reproduction of sound. Another object is to provide a device of this character which is portable and can be used with various phonographs and the like.

In its preferred form it consists of a base to which is pivoted a jointed arm. This arm is provided with an electromagnet having an armature to which is secured the usual needle. Vibrations of the needle as it follows the groove of the record induce a fluctuating current through the magnet coil and hence causes signal currents which may be controlled, amplified and reproduced in any way desired.

Fig. 1 is a side view and vertical section of a device embodying one form of my invention and showing the magnetic needle carrier in dot and dash line folded back or lifted to facilitate changing the record and the needle.

Fig. 2 is a transverse sectional view on the plane of the line 2—2 of Fig. 1 showing particularly how the needle is supported.

Fig. 3 is another sectional view on the plane of line 3—3 showing the way the magnet case is constructed.

Fig. 4 is a detail view of one bearing of the armature and needle.

Fig. 5 is a plan view on a small scale showing the device in use.

The housing 6 is adapted to rest upon any suitable support convenient to the turntable 7.

The arm consists of the inner part 8 pivoted to the housing and the outer part 9 hinged to part 8 and carrying a casing for the magnet and needle carrier above the record 11.

The housing is preferably provided with a weighted base 12 sufficiently broad so that the center of gravity of the parts will be within the perimeter of the base when the arm is

folded back as shown in the dot and dash line position of Fig. 1.

The rheostat 13 is mounted in the housing and may be held in place by its sleeve 14 and nut 15. The adjustable arm of the rheostat is carried by the shaft 16 controlled by the knob 17 above. The ring 18 forms a bearing for the arm 8. The spring washer 19 takes up play and prevents chattering. The housing is provided with an inlet or inlets 20 for the incoming wires for connection to the amplifier and loud speaker.

Another wire (not shown) may pass through hole 21 to the magnet coil. A pin and slot 22 limits the swing of the arm so as to avoid injury to the wire. The outer end of the arm 9 and the pick-up rest on the inner end 8 when folded back.

The joint 23 should also be packed so as to prevent chattering but allow such free movement as is required to accommodate the needle.

The needle-operated current modifying means may be in various forms. In the one shown, there is an electromagnet consisting of one or more layers 24 of permanent magnetic material with pole pieces 25 on which are mounted the coils 26. The armature 27 is preferably resilient and has a needle carrier or holder 28 extending from one end. A convenient connection is the shank part 29 soldered or riveted to the armature 27.

One end of the armature is supported between the soft rubber washers 30 on the rod 31. The position of this end may be adjusted by the nuts 32 and 33.

The split soft rubber tube 34 surrounds the shank 29 of the needle holder and is held in place by the clamp pieces 35 and 36 and the screws 37. By adjusting the screws more or less variation in the action of the armature may be obtained. The method described of mounting the armature in compressed rubber or other similar substance has a marked damping effect on the armature and tends to suppress oversensitivity at its natural period or harmonics thereof, thereby giving the device a flatter and more faithful response curve.

The rheostat 13 and the adjusting knob 17

constitutes a volume regulating means for the amplifier.

The base plate 38 serves to support the magnet and needle structures. The screws 37 pass through the spacing tubes 39. The screws 40 and nuts 41 and 42 secure the magnet plates in place. The threaded pillars 43 support the cover 44 and screws 45 which hold the device to the arm 9.

10 Altho I have shown a simple form of device it should be understood that the invention is not limited to the specific disclosure.

I claim:—

1. A magnetic pick-up comprising magnet  
15 coils, an armature, a needle holder secured thereto, and projecting from one end thereof, adjustable resilient means for supporting the opposite end of the armature, a stationary clamp and a resilient sleeve supporting the  
20 armature in the clamp between the magnet coils and the needle holder.

2. An electromagnetic pick-up comprising a magnet having a coil and poles, an armature at one side thereof having a needle  
25 holder at its lower end, resilient means for supporting the weight of said armature between the magnet and the needle holder, resilient means for supporting the upper end of said armature above said magnet and a single  
30 rotatable member for adjusting the spacing between the armature and the magnet, said armature being movable longitudinally and in a plane parallel to the magnet poles.

3. A magnetic pick-up comprising an elec-  
35 tro magnet, an armature therefor, having a needle holder extension, a yoke having a bearing for said extension with a screw seat on each side of the bearing, a resilient bushing on said extension in said bearing, a cap  
40 piece and two screws one in each side of the cap piece for clamping said cap piece to said yoke and compressing said bushing and a resilient support for the opposite end of said armature.

4. An electromagnetic pick-up comprising  
45 a casing, a permanent magnet having a plurality of poles, windings carried by said poles, a flexible armature having a plane surface presented to said poles, a needle  
50 holder at one end of said armature, resilient means for supporting said armature with respect to said magnet, said supporting means being located between said needle holder and said plane surface, addi-  
55 tional resilient supporting means for said armature at the end remote from said needle holder, and means for adjusting said armature toward all of said poles by a single movement whereby the distance between said poles  
60 and said armature may be varied without moving either of said poles.

5. An electromagnetic pick-up comprising  
65 a casing, a magnet contained therein and having a pole piece, a coil carried by said pole piece, a movable armature resiliently sup-

ported adjacent to said pole piece but with an air gap between said pole piece and said armature, and means for adjusting the position of said armature with respect to said pole piece, said adjustment causing no other  
70 change in the magnetic path comprising said magnet and armature and the air gap therebetween.

6. An electromagnetic pick-up having an armature adapted to be moved, a resilient  
75 support at one end of said armature, a needle-holder at the other end, a second resilient support between said needle holder and said first-named support, a magnet comprising a pole piece having a coil mounted thereon,  
80 said magnet being located adjacent said armature at a point between said resilient supports, said armature being vibratable vertically and horizontally.

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