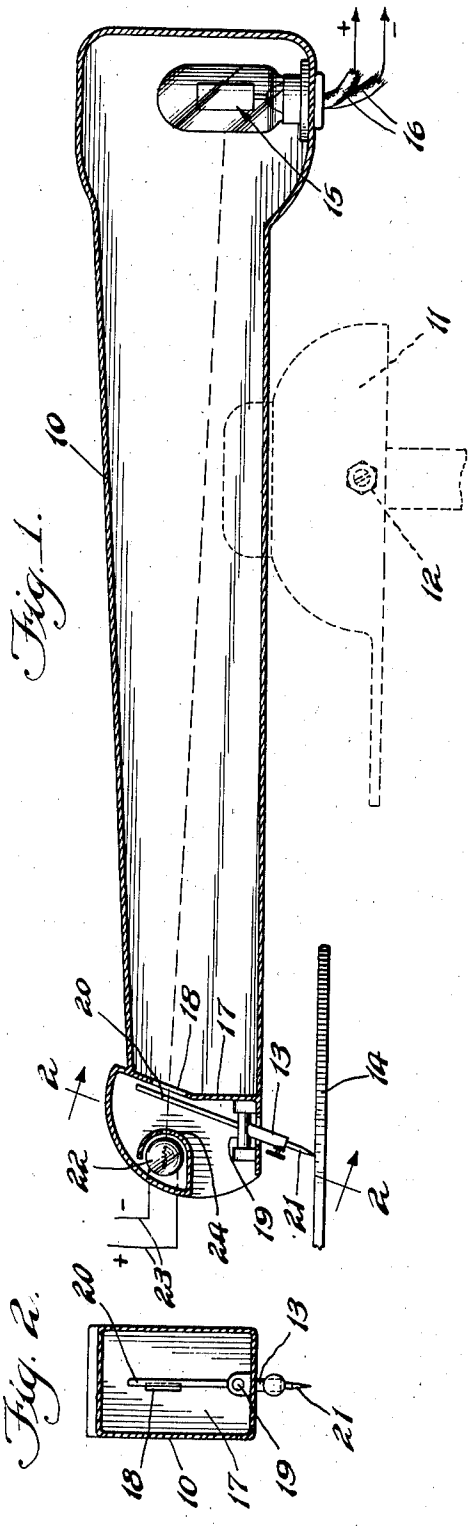
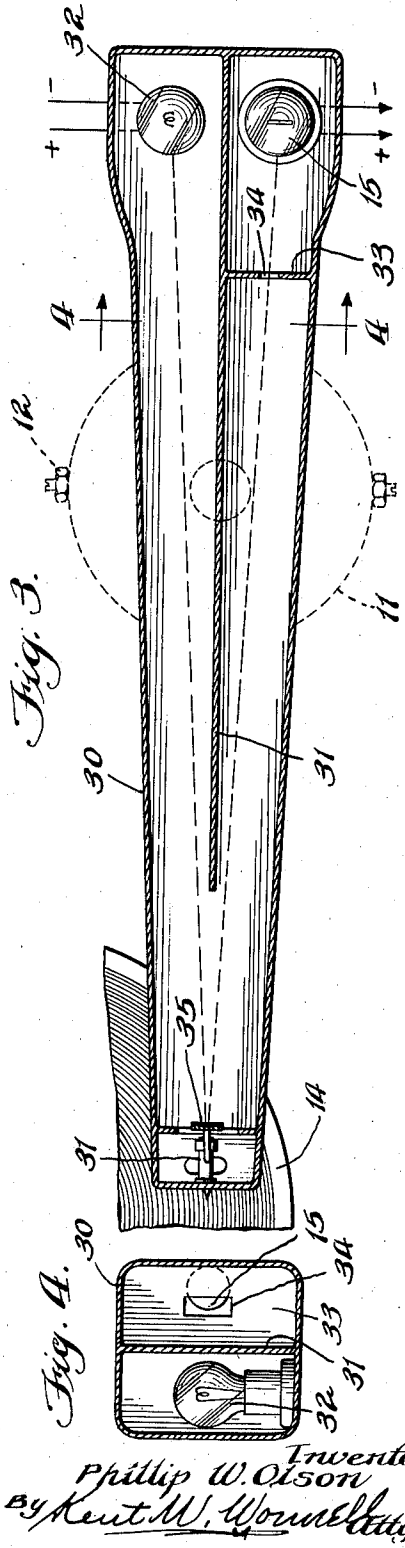
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TONE ARM PICKUP

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TONE ARM PICKUP

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6 Claims. (Cl. 179—100.41)

This invention relates in general to a sound pickup for a phonograph and is more particularly described in connection with a movable tone arm and the stylus supported thereby.

An important object of the invention is in the provision of an electrical light-sensitive sound pickup operated and controlled directly by the movement of the record engaging stylus carried by the tone arm.

A further object of the invention is in the provision of a light-sensitive pickup in connection with the tone arm.

Other objects of the invention are to simplify the tone pickup; to make the transfer of the tone pickup entirely electrical; to eliminate unnecessary weight and unnecessary wear of the record engaged by the stylus; to eliminate sound diaphragm mechanism in connection with the stylus; to eliminate the transfer of unnecessary scratching and other sounds produced by diaphragm stylus mechanism; and in general to improve the sound and tone pickup for a phonograph.

Other objects of the invention will appear hereinafter, preferred embodiments of the invention being illustrated in the accompanying drawing, in which:

Fig. 1 is a sectional view of a tone arm embodying the invention showing the stylus in engagement with a record;

Fig. 2 is a section taken on the line 2—2 of Fig. 1;

Fig. 3 shows a modification in which a mirror is located directly upon the stylus arm for varying the light; and

Fig. 4 is a section taken on the line 4—4 of Fig. 3.

The present invention relates to a tone pickup contained in and enclosed by the tone arm and comprising a lamp continuously illuminated when the phonograph is in operation, a light-sensitive cell or unit separated from the lamp and means controlled by the stylus for varying the amount of illumination which is transmitted from the lamp to the light-sensitive cell, depending upon the movement or vibrations of the stylus as received from the record.

Referring now more particularly to Figs. 1 and 2 of the drawing, a tone arm 10 represented as constructed of sheet material is mounted upon a bell base 11 which has opposite pivots 12 adapting the tone arm to turn with the base 11 about a vertical axis and to swing in a vertical plane to move its stylus 13 into and out of engagement with the irregular sound grooves of a record 14 which is to be played.

Mounted in one end of the tone arm is a light-sensitive cell or device 15 having conductors 16 for connecting it externally with any suitable electrical reproducer. Near the other end of the tone arm is a transverse partition 17 having an aperture or a vertical slot 18 through which light is admitted to affect the cell 15 and to vary it in accordance with the light variation.

The stylus 13 has a pivotal mounting 19 intermediate its ends with an upper arm 20 for swinging transversely of the tone arm to cover and uncover the slot or aperture 18 when the lower end of the stylus or a needle 21 carried thereby is in engagement with the grooves of a record so that the ordinary oscillating movement of the stylus will cover and uncover more or less of the aperture 18 in accordance therewith.

At the end of the tone arm adjacent the stylus is a lamp 22 connected externally by conductors 23 with any suitable source of current supply. The lamp is enclosed by a shield 24 in which is an aperture 25 in line with direct rays from the lamp through slot 18 to the light-sensitive device 15, so that the arm 20 controls the amount of illumination admitted or supplied to the light-sensitive device 15 through the apertures in accordance with the oscillations of the stylus.

In the form of the invention as shown by Figs. 3 and 4 a hollow arm 30 has a central longitudinally extending partition 31 separating a lamp 32 and the light-sensitive device 15 located at the same end of the arm, but this partition terminates at a distance from the stylus 13 at the other end of the arm. In the passage adjacent the device 15 is a partition 33 having an aperture 34 therein and the upper arm or end of the stylus carries a mirror 35 having a concave reflector face 36 which directly reflects more or less of the light from the lamp 15 through the slot or aperture 34, depending upon the oscillations of the stylus. The long passages in the hollow arm make the device extremely sensitive, as a minute variation of the mirror causes more lateral deviation due to the passage length.

In either of these forms it is apparent that the reproduction of the sound by the light sensitive cell or device is entirely electrical, it depends upon the vibrations or oscillations of the stylus which controls the amount of light supplied to the light-sensitive cell and no mechanical noises incident to the stylus operation or vibration are transmitted by the light-sensitive cell. Thus a much clearer tone and reproduction is possible and all mechanical objections to tone reproduction are avoided.

I claim:

1. In a sound pickup for phonographs, a hollow movable tone arm having a partition forming longitudinal passages, a source of light at the end of one passage, a light-sensitive pickup device at the adjacent end of the other passage, means forming a restricted aperture in the passage for the light-sensitive device, and means for controlling the light from the said source of light through the aperture to the light-sensitive device comprising a stylus mounted for oscillation at the end of the tone arm opposite the light-sensitive device and movable by engagement with the sound track of a record and having a reflector to vary the light which passes from the said source of light within the passages of the arm in opposite directions and through the aperture to the light-sensitive device.

2. In a tone arm sound pickup for phonographs, a hollow tone arm of a length to swing from one side over a disc record and mounted intermediate its ends for rotary movement and to swing in a plane at right angles thereto, said arm having a longitudinally extending partition forming two longitudinal light enclosing passages, a lamp at the end of one passage, an electrical light-sensitive device at the adjacent end of the other passage, a partition in the passage of the light-sensitive device having an aperture therein, means for reflecting light from the lamp through the aperture to the light-sensitive device, and a stylus to engage record grooves and mounted for oscillation at the other end of the arm having a projecting portion within and covered by the arm to control the amount of light which passes through the aperture, depending upon the oscillations of the stylus produced by its engagement with a sound track.

3. In an electrical sound pickup for phonographs, a hollow tone arm mounted intermediate its ends for movement with respect to a sound record, the tone arm having a partition forming parallel longitudinal light paths, an electric lamp at the end of one passage, an electric light-sensitive device at the same end of the other passage, a wall having an aperture in the passage including said device, means comprising a mirror at the other end of the tone arm for reflecting light from the lamp through the aperture to the light-sensitive device, and a stylus for engaging a record mounted to oscillate at the end of the tone arm opposite the lamp having means for reflecting and varying the reflected light which passes through the aperture in accordance with the sound variations of the stylus.

4. In a sound pickup, a hollow tone arm having a partition forming adjacent longitudinal light passages, a light source at the end of one passage, an electrical light-sensitive device in the other passage, means forming a restricted aperture in the passage for the light-sensitive device, a mirror at the end of the arm opposite the lamp for reflecting light therefrom through the aperture to the light-sensitive device, and a stylus at the other end of the arm having a needle for engaging the sound track of a record and mounted for oscillation thereby and having an arm for reflecting and controlling the light from the mirror through the aperture to the light-sensitive device.

5. In a sound pickup, a hollow tone arm having a partition forming parallel enclosed light passages, a lamp at the end of one passage, a light-sensitive device at the adjacent end of the other passage, means forming a restricted aperture in the passage of the light-sensitive device, a stylus mounted for oscillation at the end of the tone arm opposite the light-sensitive device, and a mirror carried by the stylus enclosed by the arm at the other end of said passages for reflecting light from the lamp through the aperture to the light-sensitive device.

6. In a sound pickup according to claim 5, the passages being formed by a partition which extends between the lamp and the device and toward the other end but terminates at a distance from the mirror, such that a direct ray will pass from the lamp to the mirror and will be reflected directly thereby to the device entirely within the hollow arm.

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