

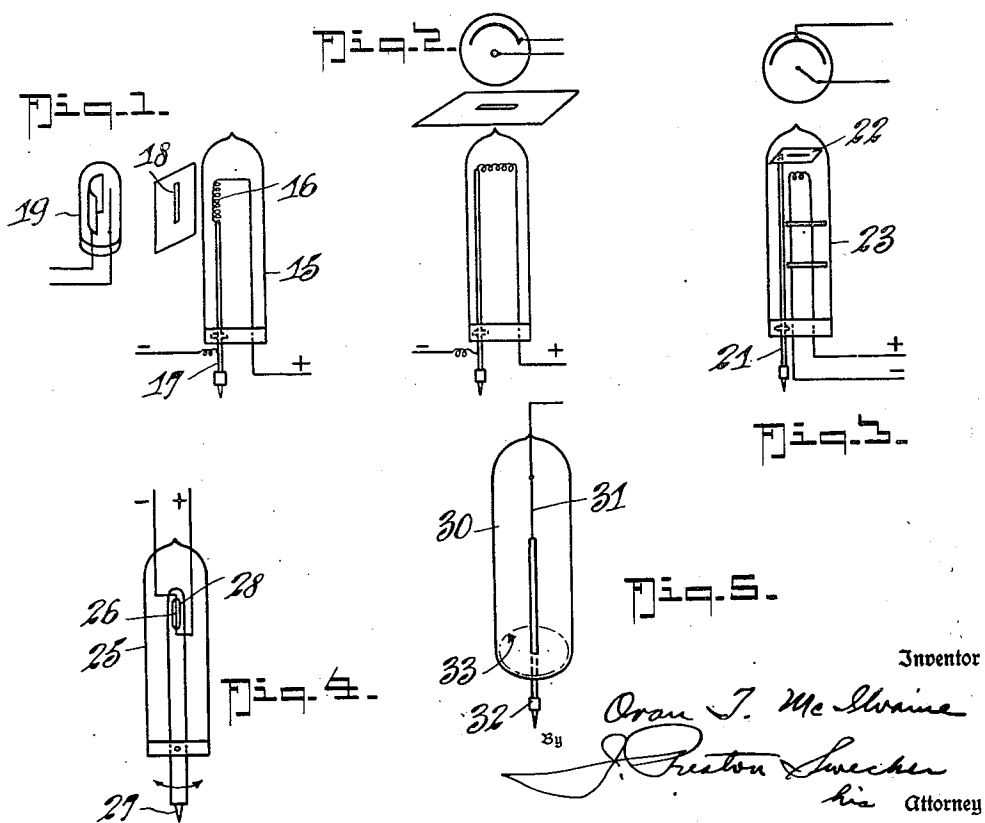
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PHONOGRAPH REPRODUCING APPARATUS

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PHONOGRAPH REPRODUCING APPARATUS

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6 Claims. (Cl. 179—100.41)

This invention relates to an improvement in phonograph reproducing apparatus.

Heretofore, apparatus used to reproduce vibrations that have been recorded on a tablet or other record surface, have been usually either magnetic or crystal. The crystal reproducers are materially better than the magnetic type, and are more frequently used. However, such crystal reproducers have several objections, particularly a typical crystal whine on high notes, and are susceptible to needle scratch.

The object of this invention is to improve the reproducing qualities, obtaining much better fidelity, and substantially eliminating needle scratch without sacrificing any of the musical range. At the same time, the vibrating mechanism may be constructed very light in weight with greater high frequency response and less wear on the record, increasing the life of the latter very materially.

This object is accomplished by controlling the operation of the reproducing apparatus from a light sensitive cell, such as a photo-electric cell and controlling the light thereto directly by means of the needle operating from the record, moving laterally in response to the vibrations recorded thereon.

The accompanying drawing illustrates different embodiments of the invention, in which:

Figs. 1 to 5 are diagrammatic views showing needle controlled light valves associated with lamps.

The invention is shown in different embodiments in Figs. 1 to 5, in which the sound record needle or stylus is adapted to engage a sound record groove in the usual way, and has an extended portion thereof projecting into a lamp. The needle is mounted for freedom of movement relative to the lamp, thereby moving the extended portion and the light controlling means connected therewith. In some forms, the extended portion constitutes one of the leads of the filament thereof, in which event it may be constructed of suitable hard conducting metal, such as tungsten.

In Fig. 1, the lamp 15 has a filament 16 therein with one side thereof connected directly to an end of the needle 17, the latter extending movably through a side wall of the lamp. Vibration of the needle 17 controls the path of light through a slot 18 to a photo-electric cell 19 since the filament will be vibrated by the needle and will thereby cause a variation of the light on the cell.

Fig. 2 is similar to Fig. 1, except that the fila-

ment is arranged to project a beam of light through the end of the lamp.

In Fig. 3, the needle 21 is connected with a slotted light shutter 22 which is movably mounted in the lamp 23, so that vibrations from the needle 21 will move the shutter sufficiently to vary the light on the cell, while the filament in the lamp 23 remains stationary.

In Fig. 4, the lamp 25 has a stationary filament 26 therein, while the needle 27 has a slot 28 formed directly therein to vary the position thereof in response to vibration of the needle.

Fig. 5 shows another form of lamp 30 having a filament 31 connected directly with the needle 32, while the latter extends through a metal diaphragm 33 of Kovar or other metal that will seal to the glass or other material and through the center of which the needle extends.

By thus utilizing the reproducing needle that moves in response to the recorded vibrations, the reproduction from the phonograph record may be obtained with very improved results, greater fidelity, lightness in weight with much less wear on the record greatly lengthening its period of use and also eliminating needle scratch without sacrificing different frequencies or tones.

I claim:

1. In a pick-up device adapted to be associated with a light responsive device, a stylus adapted to be actuated by a sound record and having an extended portion, an enclosed lamp receiving said extended portion of the stylus therein, said extended portion of the stylus having means connected therewith in the lamp for varying the light on the light responsive device.

2. In a pick-up device adapted to be associated with a light responsive device, a stylus adapted to be actuated by a sound record and having an extended portion, an enclosed lamp receiving said extended portion of the stylus therein, said extended portion of the stylus having a filament connected therewith and movable by the stylus for varying the light on the light responsive device.

3. In a pick-up device adapted to be associated with a light responsive device, a stylus adapted to be actuated by a sound record and having an extended portion, an enclosed lamp receiving said extended portion of the stylus therein, said extended portion of the stylus having a filament connected therewith and movable by the stylus for varying the light on the light responsive device, and a lead connected with said stylus for supplying current therethrough to said filament.

4. In a pick-up device adapted to be associated

with a light responsive device, a stylus adapted to be actuated by a sound record and having an extended portion, an enclosed lamp including an envelope and a light source therein, said envelope receiving said extended portion of the stylus therein, and means actuated by the extended portion of the stylus in the envelope for varying the light on the light responsive device.

5. In a pick-up device adapted to be associated with a light responsive device, a stylus adapted to be actuated by a sound record and having an extended portion, an enclosed lamp receiving said extended portion of the stylus therein, means mounting said stylus and extended portion for movement relative to said lamp, said lamp including a filament therein having one end thereof connected directly with said ex-

tended portion of the stylus for varying the light on the light responsive device in response to movement of the stylus.

6. In a pick-up device adapted to be associated with a light responsive device, a stylus adapted to be actuated by a sound record and having an extended portion, an enclosed lamp receiving said extended portion of the stylus therein, means mounting said stylus and extended portion for movement relative to said lamp, said lamp including a filament mounted therein, and means connected with said extended portion of the stylus and having an opening therein for the passage of light from the filament to the light responsive device and for varying the light thereto in response to movement of the stylus.

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