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This invention relates to improvements in talking machines of the type having a deflector toward which the sound waves from the tone arm are directed by an amplifier to which the tone arm is pivoted in such a way as to permit of universal relative movement when the tone arm is lowered for use, and to permit of the tone arm being raised or folded back into close relation to the amplifier within the deflector when out of use.

In British Specification No. 3033 of 1914, a thumb screw is suggested as a means for locking the tone arm in the raised position.

This arrangement obviates the necessity for the detachment of the tone arm and to a considerable degree avoids the ingress of dust, but as the thumb screw necessitates a slot in the sleeve joint between the tone arm and amplifier, there is still a liability for a certain amount of dust finding an entry through the slot. Dust entering at the joint is liable to affect the reproducer and it is highly desirable to exclude dust at these parts. Moreover even when the tone arm is locked in the raised position it is possible for it to swing about the vertical axis of the amplifier which leads to damage of the reproducer when the reflector lid is closed down while the tone arm is so displaced.

This has to some extent been mitigated in practice by the provision of a spring catch which, however, owing to the necessity for it to yield readily when the tone arm had to be lowered, was so resilient as to yield to rough handling of the ~~g~~ talking machine casing, and the tone arm and reproducer were still liable to fall or project forward sufficiently to be damaged on closure of the lid of the casing.

The above disadvantages are avoided by the present invention, according to which the clamp for the sleeve joint between the tone arm and amplifier is devoid of any openings

permitting ingress of dust. It is of such form that it is easier to manipulate, giving greater leverage, than the clamping nut hitherto used and also being neater in appearance. Means are also provided by which the tone arm is positively held against a swiveling motion relatively to the vertical axis of the amplifier when the arm is in the raised position or folded back within the deflector.

One embodiment of the invention is illustrated in the accompanying drawings in which:

Figure 1 is a perspective view of a talking machine of the type referred to showing the tone arm in its operative position.

Figure 2 is a cross sectional elevation of the universal joint between the tone arm and the amplifier.

Figures 3 and 4 are side elevations of the amplifier and tone arm, the tone arm being shown in its operative position in Figure 3 and raised in Figure 4, the arm being broken away to show the means for holding it in the vertical position.

Figure 5 is a cross sectional elevation of a universal joint between the tone arm and the amplifier showing another form of attachment for the means for holding the tone arm in the vertical position.

Figure 6 is a cross-sectional elevation on the line VI-VI Figure 5.

Figure 7 is an end view of the universal joint with the clamping means removed.

Figure 8 is a perspective view of a modified form of the means for holding the tone arm in the vertical position.

Figure 9 is a section on IX-IX Figure 5 as seen in the direction of the arm.

In the embodiment of the invention illustrated the tone arm 1 has a short cylindrical extension 2 Figure 2, which fits rotatably into the end of a horizontal sleeve 3. A cross bar 4 in the open end of the extension 2 carries a shaft rod 5 having a reduced end 6 which is screw threaded for a part of its

length and passes through a hole formed in a plate 8, which closes the horizontal sleeve 3 near the end remote from the tone arm. A cap 9 having a milled edge, and provided with a shoulder 10 to fit the interior of the horizontal sleeve 3, is adapted to screw on to the screw threaded end 6 of the shaft 5, a screw 11 being provided on the end of the shaft 5, to prevent accidental removal of the disk 9.

The tone arm is provided with a resilient tongue 13 so that when the tone arm is raised or folded back into the deflector 14, Figure 1, the resilient tongue 13 passes between a flat bearing strip 15 secured to the side of the amplifier 21, and a flat spring 16, the spring being screwed to the bearing strip 15, by a screw 35 and the strip 15 being secured by screws 36 to the amplifier 21 as shown in Figures 2, 3 and 4. The tongue 13 is made in one with a ring 12 surrounding the extension 3 of the tone arm 1, and having a lug 30 screwed to a lug 31 on the tone arm as shown in Figures 2, 3 and 4, or it has an extension 32 passing through a slot in the extension 2 of the tone arm and secured to the end of the shaft 5, as shown in Figures 5 and 6. The extension 32 of the tongue 13 is preferably situated behind the cross bar 4 in the open end of the tone arm extension 2 as shown in Figures 5 and 6, so as to obstruct the passage as little as possible. The leading edge of the flat bearing strip 15 may be beveled so as to guide the tongue 13 onto it, the tongue being set to engage the surface with a certain degree of friction, or if desired the leading edge of the tongue itself may be beveled. Moreover the spring 16 may be arranged to bear against the tongue 13. By suitably rotating the milled cap 9 after the tone arm has been raised the tongue 13 is still further drawn against the flat bearing strip 15, so that the required degree of friction may be set up in order to prevent movement of the tone arm, about a horizontal axis.

In the form shown in Figure 8, a projection 33 on the spring 16 is provided to enter a slot 34 cut in the tongue 13

when the tone arm is in the vertical position. As shown in Figure 8 the projection 33 is formed by pressing out the spring 26.

The horizontal sleeve 3 is provided with a short vertical tubular extension 17, which is surrounded at its upper end by a ring 18 having a cross bar 19 which carries a vertical pivot pin 20. The amplifier 21 is secured at its lower end to a ring 22 having a shoulder 23. The ring 22 fits over the ring 18, the shoulder 23 resting on it. A vertical sleeve 25 is supported by a cross bar 24 carried by <sup>the</sup> ring 22, and is arranged so as to slide over the vertical pivot pin 20 when the amplifier is placed in position. Nuts 26 on the projecting, screw-threaded end of the pin 20 prevent removal of the amplifier. It will be seen that the horizontal sleeve 3 can rotate about a vertical axis with relation to the amplifier 21, but is not normally removable therefrom, and that the tone arm 1 is universally jointed to the amplifier 21. A spiral spring 27, Figures 2, 5 and 7 is anchored at one end to the reduced end 6 of the shaft 5, its other end being bent at right angles to enter one of a series of holes 28 in the plate 8, thus counteracting to some extent the weight of the tone arm and reproducer when they are in the operative position.

By removal of the milled cap 9 the spring 27 is rendered easily accessible, as shown in Figure 7, thus enabling any unskilled person to remove, renew or adjust it, the last mentioned operation being carried out by moving the end of the spring 27 from one to another of the anchoring holes 28.

When the tone arm is raised, with the tongue 13 in engagement with the flat bearing strip 15 on the amplifier, and the milled cap 9 is rotated, it is firmly locked, in this position, and is not able to move about its horizontal or vertical axis, so that the lid of the talking machine casing may be lowered without fear of damaging the reproducer.

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When the tone arm is to be lowered the milled cap 9 is slightly rotated in order to relieve the friction between the tongue 13 and the flat surface 15.

A stop 29 on the cross bar 24 is arranged to come into contact with the cross bar 19 and thus limit the swiveling movement between the horizontal sleeve of the tone arm and the amplifier to facilitate correct positioning of the resilient tongue 13 with respect to the flat surface 15.