Nov. 11, 1930. A. L. THURAS 1,781,351

VIBRATORY SYSTEM

Filed March 26, 1926

Fig.1.

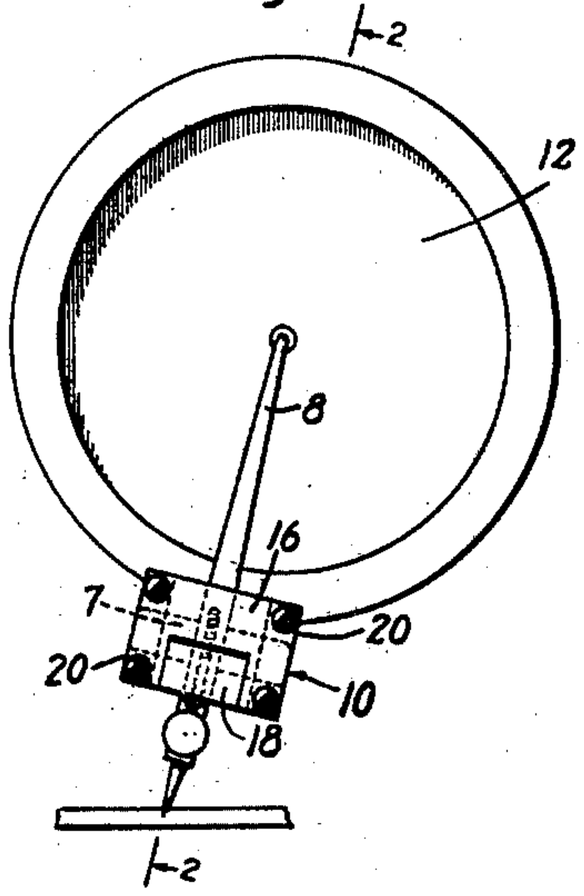


Fig.2.

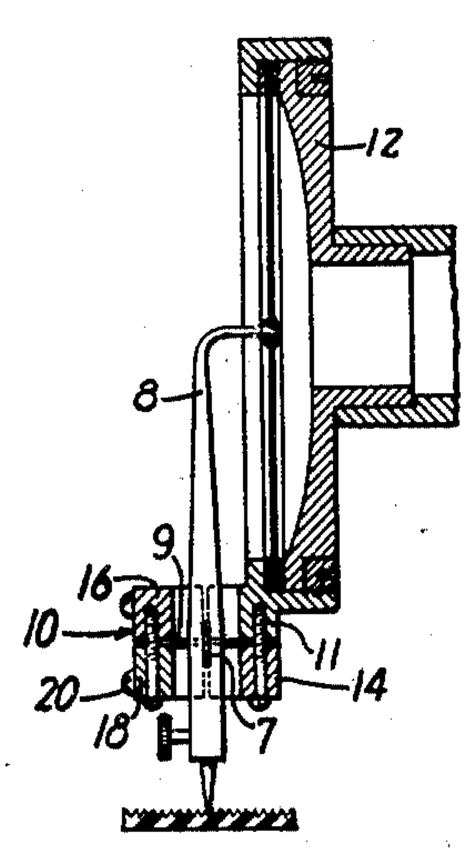


Fig.3.

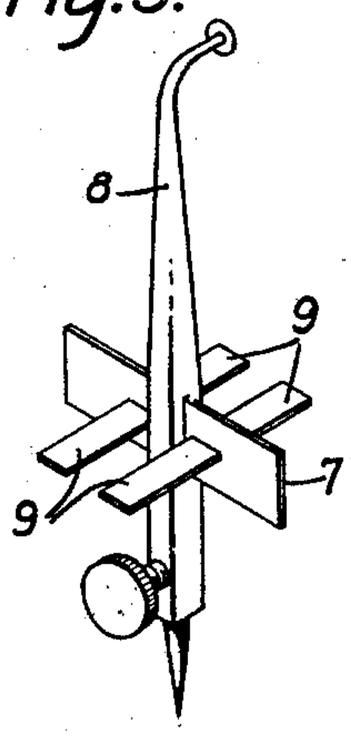
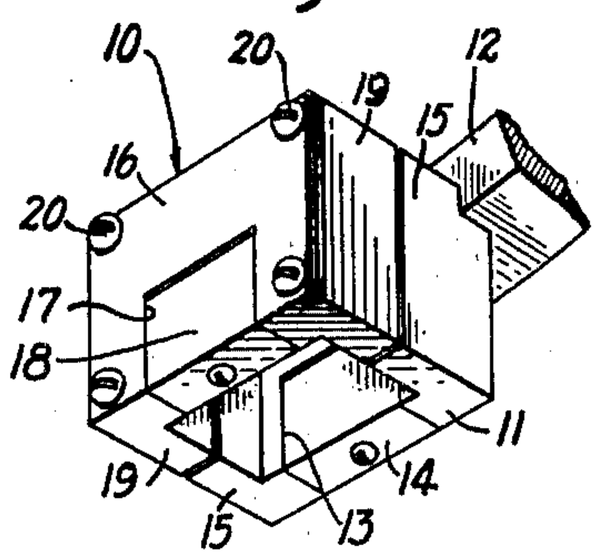


Fig.4.



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Patented Nov. 11, 1930 1,781,351

UNITED STATES PATENT OFFICE

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VIBRATORY SYSTEM

Application filed March 26, 1926. Serial No. 97,608.

This invention relates to improvements in vibratory systems and more particularly to the mounting of the oscillatory elements thereof.

The primary object of the invention is to provide for the faithful transmission of vibrations without distortion or the introduction of undesirable foreign vibrations.

Another object of the invention is to provide for the return of the vibratory element to a neutral position as soon as the actuating influence ceases.

In carrying the invention into practice the vibratory element is so mounted that it is free to oscillate in one plane about a given axis, but is held against movement in any other direction, it also being understood that bodily movement of the vibratory element in any direction is likewise overcome. Furthermore, the mounting is such as to eliminate all pivots and like structures which, through wear or lack of maintenance, are apt to become loose and create distortion.

Illustrative of a specific aspect of the invention the vibratory element is represented by the stylus bar of a reproducer such as is in common use on phonographs and the like. One end of the stylus bar carries the usual stylus for contact with a sound record while the opposite end is secured to the diaphragm of the reproducer. The stylus bar is fixed intermediate its ends to a torsion member, commonly known as a reed, the ends of which are secured to the body of the reproducer so that the stylus bar is firmly supported, yet easily oscillated in one direction. In order to further support and brace the reed, and to prevent bodily movement of the stylus bar in the plane of its oscillation, tension, or tie, members are secured to opposite sides of the reed on each side of the stylus bar. These tension, or tie, members are arranged in a plane with the longitudinal axis of the reed and their opposite ends are fixed, as are the ends of the reed. It will thus be apparent that any tendency of the reed to bow and bodily move the stylus bar toward or away from the diaphragm will be overcome. It will also be evident that the stylus bar will be yieldably held in neutral position by the resilience of the reed and tension members which resilience acts to maintain the diaphragm in proper position and overcome any distortion thereof.

The invention may be more clearly understood by reference to the accompanying drawing, in which,

Fig. 1 is a side view of a reproducer equipped with a stylus bar mounted in accordance with this invention,

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1,

Fig. 3 is a perspective view of a stylus bar showing the same assembled on a reed embodying this invention, and

Fig. 4 is a perspective view of one supporting means for the stylus mounting shown in Fig. 3.

Referring to the drawings in detail the improved stylus mounting, comprises a torsion member or reed 7 of spring steel or other suitable material intermediate of the ends of which the vibratory element 8, commonly referred to as a stylus bar, is rigidly mounted. The reed 7 may be secured to the vibratory element 8 by electro-welding, silver soldering or by any other suitable method. Secured in a similar manner to opposite sides of the torsion member 7, on opposite sides of the vibratory element 8, are tension, or tie, members 9 of spring steel or suitable spring material. The tension, or tie, members 9 lie in one plane which, in the structure shown, is perpendicular to the plane of the torsion member and intersects it along the line of the axis of oscillation of the stylus bar. The ends of the torsion member and the outer ends of the tension members are rigidly held in the stylus mounting supporting means to be more fully described hereinafter.

The stylus mounting supporting means is designated generically by the numeral 10 and comprises a stationary plate 11 which is rigidly associated with a reproducer 12. The plate 11 is provided intermediate its ends with a recess 13 which opens outwardly through one edge and receives a clamping block 14. Formed at opposite ends of the stationary plate 11 are parallel arms 15 which extend outwardly from one side of said plate as clearly shown in Figure 4.

Cooperating with the stationary plate 11 is a clamping plate 16, which like the plate 11 is formed intermediate its ends with a recess 17 which opens outwardly through one edge and receives the clamping block 18. The plate 16 is provided at its opposite ends with laterally extending parallel arms 19 which are retained in abutting engagement with the ends of the arms 15 by means of suitable attaching devices such as screws 20.

Clamped between the abutting ends of the arms 15 and 19 is the torsion member or reed 7 while the outer ends of the tension members 9 are received in the recesses 13 and 17 and are retained against the inner wall thereof by means of the clamping blocks 14 and 18.

It will thus be seen that the parts are securely held in proper position at all times and danger of the device getting out of adjustment is minimized, owing to the elimination of pivots. The lateral bracing of the torsion member 7, by the tension members 9, overcomes any bowing tendency of said torsion member and consequent bodily movement of the vibratory element 8 in the plane of its oscillation. Furthermore, it will be obvious that as the torsion member 7 is flexed, the tension members 9 are put under stress and will aid the torsion member in returning the vibratory element to its normal position Thus it will be seen that the opportunities for the diaphragm to become distorted are reduced to the minimum without in any way hampering the free oscillation of the vibratory element.

What is claimed is:

1. A mounting for a vibratory element comprising a torsion member and tension members extending from opposite sides of said torsion member to prevent lateral deflection thereof and means for rigidly supporting one end of each tension member.

2. A mounting for a vibratory element comprising a torsion member, and tension members secured to and extending from opposite sides of the torsion member in a plane with its longitudinal axis.

3. A mounting for a vibratory element comprising a torsion member rigidly supported at opposite ends, and tension members secured to and extending from opposite sides of the torsion member in a plane with its longitudinal axis.

4. A mounting for a vibratory element comprising a torsion member, tension members secured to and extending from opposite sides of the torsion member in a plane with its longitudinal axis, and supporting means for the outer ends of the tension members.

5. A mounting for a vibratory element comprising a torsion member, means rigidly supporting the ends of the torsion member, tension members extending from opposite sides of the torsion member, and means rigidly supporting the ends of the tension members.

6. A flexible mounting comprising a torsion member, means rigidly supporting the ends thereof, a vibratory element supported intermediate the ends of the torsion member, tension members secured to opposite faces of the torsion member, and means rigidly supporting the ends of the tension members.

7. A flexible mounting comprising a torsion member, means rigidly supporting the ends thereof, a vibratory element supported intermediate the ends of the torsion member, tension members secured to opposite faces of the torsion member on opposite sides of the vibratory element, and means rigidly supporting the ends of the tension members.

8. A mounting for a vibratory element comprising a torsion member extending laterally from each side of said element, a plurality of tension members at right angles to said torsion member for preventing transverse movement thereof, one end of each tension member being connected to the torsion member adjacent said element and means for rigidly supporting the opposite ends of each tension member.

9. A mounting for a vibratory element comprising a thin flat torsion member, extending laterally from each side of said element, said torsion member being inflexible in its own plane, and a plurality of thin flat tension members on each side of said torsion member adjacent said element for preventing transverse movement of said torsion member, the planes of said tension members intersecting the plane of said torsion member at the axis of oscillation of said element and means for rigidly supporting one end of each tension member.

10. A mounting for a vibratory element comprising a torsion member, supports to which the ends of said torsion member are rigidly connected, a pair of tension members extending from one side of said torsion member and a second pair of tension members extending from the opposite side, for preventing transverse movement of said torsion member, all of said tension members lying in the same plane and means for rigidly supporting one end of each tension member.

11. The combination of a diaphragm, a vibratory element and a mounting for said element comprising a thin flat torsion member lying in a plane parallel to the plane of said

diaphragm, supports for the ends of said torsion member, a plurality of tension members lying in a plane at right angles to the plane of the diaphragm and extending from the opposite sides of said torsion member for preventing transverse deflections thereof and means for rigidly supporting the opposite ends of each tension member.

In witness whereof, I hereunto subscribe my name this 22 day of March, A. D. 1926.

ALBERT L. THURAS.