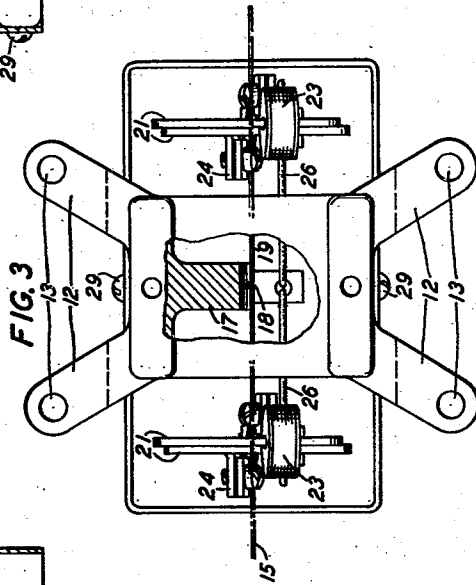
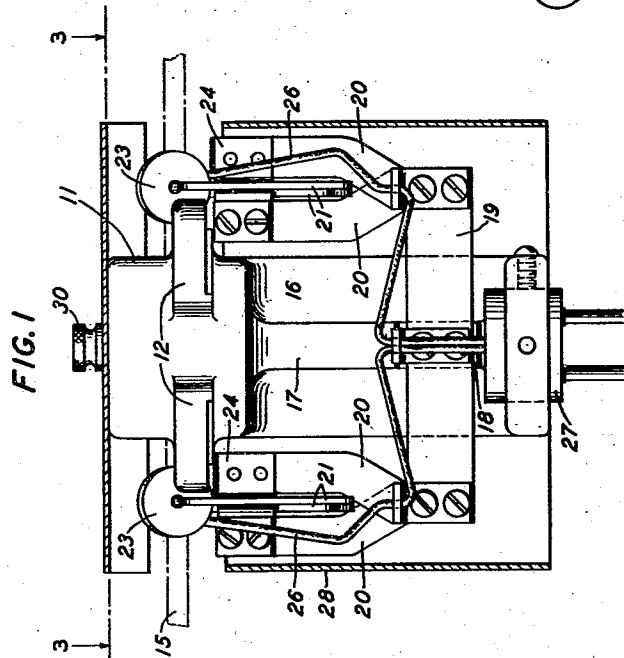
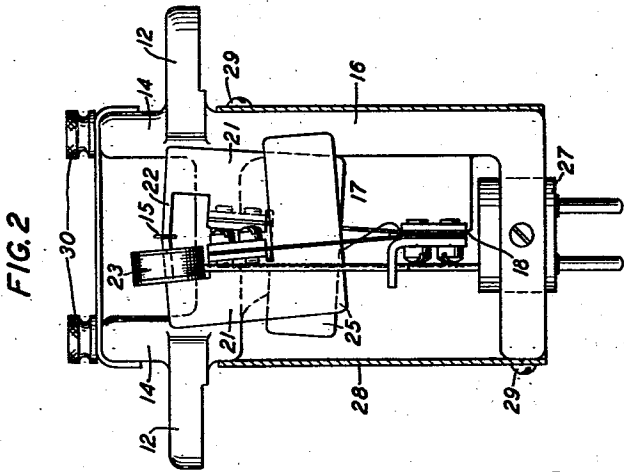


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MAGNETIC TELEPHONE

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MAGNETIC TELEGRAPHONE

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5 Claims. (Cl. 179-100.2)

This invention relates to magnetic telegraphones and particularly to the means for mounting the pole-pieces which cooperate with the record wire or tape.

A telegraphone pole-piece mounting should be of such a nature as to permit the pole-pieces to be spread easily to receive the tape and to follow freely any lateral vibratory motion of the tape so as to keep the pressures of the pole faces on the tape substantially equal at all times. While various mountings have been proposed heretofore to meet these requirements, many of them involved pole-piece holders of such a nature that the pole tips, under the force of friction with the tape surface, vibrated or chattered slightly in a longitudinal sense, thereby introducing noise and other distortion or became displaced one with respect to the other thereby adversely affecting the output and frequency response of the telegraphone. Attempts to eliminate this chattering and displacement usually resulted in a sacrifice of the desired lateral flexibility.

The object of this invention is a pole-piece mounting which eliminates this objectionable chatter without loss of lateral flexibility or other desirable features.

These results are obtained according to the invention by mounting each pole-piece on one end of a long flat spring extending some distance laterally of the tape to the end of a main supporting spring disposed in the plane of the tape at some distance therefrom. The main spring is preferably secured at the center to the frame of the unit with the individual pole-piece springs secured to its free ends in pairs and at right angles to the main spring to form a substantially U-shaped spring assembly. This provides a compact symmetrical structure which supports both the erasing and recording magnets and which may be readily replaced as a single unit.

These and other features of the invention will be more clearly understood from the following detailed description and the accompanying drawing, in which

Fig. 1 is a side view with the casing broken away to show the mounting springs;

Fig. 2 is an end view; and

Fig. 3 is a top view of one embodiment of the invention.

Referring to the drawing, the frame 11 is preferably of cast brass or other non-ferrous metal with four integral arms 12 for mounting the unit on the structure of the telegraphone by

means of machine screws in the holes 13. As shown more clearly in Fig. 2, the upper part of the frame has two upwardly extending side-pieces 14, 14 between which the tape 15 is moved by the reeling mechanism of the machine. The lower part of the frame comprises an L-shaped side-piece 16 and the web member 17 which terminates in a flat mounting surface 18 (Fig. 3) in substantially the plane of the tape.

Secured at its center to this mounting surface is the main supporting spring 19 which is preferably of phosphor-bronze about two inches long by three-eighths inch wide and five mil-inch thick. Extending upwardly from each free end of this spring are the pole-piece supporting springs 20, 20 which are also of phosphor-bronze but about one and one-half inches long and somewhat narrower and thicker than the main spring 19. The pole-piece springs are offset to form a U between the arms of which the pole-pieces 21, 21 are mounted with their pole faces engaging opposite sides of the tape 15.

The four pole-pieces 21 may, of course, be of any desired type but those shown are identical in shape and are preferably formed from sheet molybdenum permalloy about 40 mil-inch thick. The vertical dimension of the tip portions 22 will, of course, depend on the width of the tape 15 and they are of sufficient length to mount a coil 23 without interfering with the motion of the tape. The central portions of the pole-pieces are bent at right angles to form lugs 24 for attaching the pole-pieces to the mounting springs 20 as shown in Fig. 1. Below the lugs the pole-pieces have overlapping areas 25, 25 which are very large as compared with the pole face areas. The pole-pieces 21 of each pair are mounted in free, sliding contact with each other or with a very small gap between them to eliminate entirely any frictional force which would restrict lateral motion. In either case, due to the large area of overlapping, there is a return path of very low reluctance for the flux in the pole tips as explained in more detail in a copending application of C. A. Lovell, A. H. Muller and D. E. Wooldridge Serial No. 284,174, filed July 13, 1939.

When the pole tips are spread to receive the tape, the springs 20 are deflected as shown in Fig. 2 thereby developing restoring forces which hold the pole faces firmly in contact with the tape. If for any reason the tape moves or vibrates laterally with respect to its normal line of

movement, the spring 19, being thinner than the springs 20, will deflect in a torsional sense and the opposed pole-pieces and springs 20 will follow the lateral motion of the tape as a unit. For the small amplitudes of lateral motion which can occur the pressure of the pole faces on the tape will therefore be substantially unchanged.

While, as just explained, this mounting is quite free to move in a plane normal to the tape surface, the springs 19 and 20, being disposed substantially in the plane of the tape, present a very high stiffness to any forces tending to displace the pole-pieces longitudinally of the tape.

Assuming that the tape moves from left to right in Fig. 1, the left-hand pole-pieces will be used for erasing and the right-hand pole-pieces for recording and reproducing. The leads 26 from both of the coils 23 are brought down to a pin-type plug 27 mounted in the base of the frame 11 so that the unit may be readily connected to the machine by merely inserting the pins of the plug into a corresponding socket on the machine and securing the unit in place by means of set screws in the arms 12. For convenience of inspection or repair, the outer casing 28 which protects the springs from mechanical injury is removably secured to the frame by set screws 29 and the tape cover is similarly held in place by thumb screws 30.

It will be apparent that this pole-piece assembly is equally suitable for various types of magnetic recording systems and that although the overlapping portions of the pole-pieces are in contact, or substantially so, the pole tips may be so shaped that the pole faces are aligned, longitudinally displaced or in some intermediate position as determined by the type of recording desired. For best results the pole-pieces and springs must be secured in their proper relative positions rather accurately but this is readily accomplished without tedious adjustments by assembling the parts in a suitable jig to determine their proper alignment and then tightening the various machine screws while maintaining this alignment.

While the invention has been described for purposes of illustration with reference to a particular embodiment, the structure shown may be modified in various ways within the scope of the following claims.

What is claimed is:

1. A telegraphone pole-piece assembly comprising a thin flat spring having at least one free end, supporting means therefor, a pair of thin flat spring members secured at one end to the free end of the spring and extending at right angles thereto in substantially the plane of the spring and a pair of companion pole-pieces secured in opposing relationship to the other ends of the spring members.

2. In a mounting for telegraphone pole-pieces, a supporting structure, a U-shaped spring assembly comprising a thin flat spring member secured at its center to the structure and furcated arms each having two flat springs normally disposed substantially parallel to the plane of the spring member, and a pair of companion pole-pieces mounted on the springs of each of the furcated arms.

3. In a telegraphone, the combination with a moving tape record member and two pole-pieces engaging opposite sides of the member, of a thin flat spring mounted in the plane of the tape with one end free to deflect torsionally and in a direction normal to the plane of the tape and two flat spring members secured at one end in the plane of the tape to the free end of the spring extending toward the tape and holding the pole-pieces in engagement with the tape.

4. A telegraphone pole-piece assembly comprising a pair of pole-pieces having pole faces adapted to contact opposite sides of a tape record member and large wing extensions for forming a yoke between the pole faces, thin flat springs each secured at one end to one of the pole-pieces, and means of high stiffness in the plane of the pole faces and of low stiffness in the plane normal to the pole faces supporting the springs in substantially the plane of the pole faces with the wing extensions in overlapping relation.

5. A pole-piece assembly for telegraphones comprising a mounting frame, a thin, flat, main supporting spring secured at its center to the frame, a pair of pole-piece supporting springs secured to each end of the main spring and extending substantially at right angles thereto, and a pair of companion pole-pieces mounted on each pair of pole-piece springs and having pole faces substantially in the plane of the main spring.

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