The invention relates to a magnetic transducer head and more particularly to a magnetic head for recording sound on a magnetic tape or for reproducing sound therefrom.

Therefore it has been proposed to construct a magnetic head in two halves each having inclined core legs having plane faces which abut at one end of the head and which are slightly spaced apart by a separator at the other end to provide a narrow gap where the sound is translated onto or from the tape.

An object of the present invention is to improve and simplify the means for holding the two halves together.

A further object of the invention is to hold the core halves together by tension. This has the advantage of avoiding an increase in the core loss due to excessive pressure as encountered with certain devices such as clamps heretofore used.

A further object of the invention is to provide an adjustable mount for the head whereby it can be adjusted in both height and orientation so as to properly position the magnetic gap with respect to the tape.

For further details of the invention reference may be made to the drawings wherein—

Fig. 1 is a vertical sectional view of a magnetic transducer head according to the present invention.

Fig. 2 is an enlarged sectional view on line 2--2 of Fig. 1 looking in the direction of the arrows, the view being rotated clockwise a quarter turn.

Fig. 3 is a sectional view on line 3--3 of Fig. 2 looking in the direction of the arrows.

Fig. 4 is a perspective view of one of the flat laminations of the core, the dot dash line representing the line along which the corners are cut to provide the flat faces which fit with corresponding flat faces on a similar lamination reversed in position as shown in Fig. 2.

Fig. 5 is an enlarged perspective view of the tensioning device for holding the core halves together.

Fig. 6 is a perspective view of one of the bow springs supporting the head.

Referring in detail to the drawings, head 1 as previously described is made in two halves indicated at 2 and 3 in Fig. 2, each half having a coil shown at 4 and 5 respectively. In each coil is a magnetic core in the form of a stack of laminations one of which is shown at 6 in Fig. 4, each such lamination being flat, with diverging or inclined core leg portions 14, 15. The corners on one side of the lamination are cut away along the dot dash line indicated at 7 so that plane faces 8 and 9 at one end of the head fitting together as shown at 12, while the plane faces 11 and 12 at the other end of the head are separated by a non-magnetic separator 13 which may be .0005 inch thick, to provide a narrow linear gap.

The laminations 6 are stacked, end discs 16 and 17 of insulating material are passed over the legs like 14 and 15 respectively and this assembly is dipped in varnish and baked to provide a magnetic core half and form on which the coil 4 is wound. The other half 3 of the head is made the same way.

The lamination 6 has an intermediate portion 36 having parallel sides having the same length as the length of the coil and adjacent the juncture of the legs 14 and 15 therewith is provided a notch shown at 18 on one side of the leg 15 and a notch 19 on the corresponding side of leg 14. Hence each stack of laminations which forms the core portion for the head half 2, 3 has a pair of parallel notches like 18 and 19 which extend the full height of the stack.

In order to hold the two halves of the head together with corresponding legs in abutting relation, there are provided two plates like plate 20 shown in Fig. 5. The plates like 20 are of non-magnetic spring material such as Phosphor bronze or beryllium copper. The plates 20 are provided with a central aperture 21 in which the corresponding legs like 14 and 24 at one end of the head project, while the corresponding legs 15 and 25 at the other end of the head project through a similar aperture 121 in a plate 26 like plate 20 as indicated in Fig. 2.

The aperture 21 has upper and lower edges 27 and 28 which are parallel and spaced apart the same as the height of the stack of laminations in order to prevent one core half from shifting with respect to the other in a plane at right angles to the drawing as seen in Fig. 2. At the opposite end of the aperture 21 are provided integral leaf spring portions 25 and 30 which fit into the recesses 31 and 16 respectively at the outer side of the legs. Recess 31 is the same as recess 16 except that it is obverse in position as shown in Fig. 2. The length of the spring 25 is the same as the length of recess 31 and the length of spring 30 is the same as the length of recess 16, whereby the end 32 of spring 25 extends behind the end wall 33 of the notch 31, to hold the plate 20 against the disc 16 on the end of the coil 5. The end 34 of spring 30 similarly lies in the notch 16 and extends behind the end wall 35 of that notch, to hold other side of plate 20 against the disc 16 at the end of coil 4.

Springs 29 and 30 are compression springs and
hence they force one end of the two halves 2 and 3 together with spring tension. Also as the springs 29 and 30 fit in their respective notches 31 and 19, respectively, this holds plate 20 in position and prevents it from being withdrawn lengthwise from the legs 14 and 24, unless of course one were to pry such springs out of their notches.

The faces 8 and 9 are likewise held together by plate 26 having a spring 40 which fits in notch 18 and a spring 41 which fits in a similar notch 42. The springs 40 and 41 are like the springs 29 and 30 and are arranged on the plate 26.

The plate 26 serves also to support its end of the head, in having an integral flange 43 extending at right angles to the body 44 of the plate. Flange 43 has three bolt holes 45, 46, and 47. The companion plate 25 has a similar flange indicated at 48 also having three similar bolt holes. The flanges 43 and 48 lie in the same horizontal plane and serve as brackets to support the head. The flanges 43 and 48 are provided with a full floating compression spring support provided by a bow spring like spring 50 in Fig. 6, for each flange. Spring 50 has a flat intermediate portion 51 having a bolt hole 52. Spring 50 has elevated ends 53 and 54 each having an enlarged bolt hole indicated at 55 and 56, respectively. The spring ends 53 and 54 support the ends of flange 48 as shown in Fig. 3 while the intermediate portion 51 is supported by a shallow base 59 on which fits a cover 57 which fits over the head. The cover 57 has an opening 58 through which the outer ends of the legs 14 and 24 project so that the tape 60 can ride thereon.

A key 61 passes through a hole like 45 in flange 48 and through hole 55 in the end of spring 50 and through a hole 62 in the base 59 and through a panel 63. Bolt 61 has a head 64 at its upper end and its lower end has threads 65 for a nut 66. The bolts 61 and 66 in like manner pass through the similar holes in the flange 48, spring 51, base 59 and panel 63, being provided with nuts 68 and 70, respectively, at their lower ends. The spring 50 is a compression spring tending to push the head away from the panel 63, such action being restrained by the bolts 61, 67 and 68 to a degree depending upon how far their respective nuts are threaded on these bolts. It will be apparent, therefore, that the nuts 66, 69 and 70 can be adjusted by either equal or unequal amounts, to adjust the elevation of gap 13 with respect to panel 63 or to orient gap 13 to bring it to a desired vertical position with respect to panel 63, in order to properly locate the gap 13 with respect to tape 60. Tape 60 is supported by guide rollers or the like mounted on panel 63. Such guide rollers and a suitable drive for the tape is well known and not illustrated.

The other end of the head has three similar adjusting bolts 71, 72, and 73 and a section through them corresponding to section 3—3 would look the same as shown in Fig. 3, such bolts acting on a spring 77 like 50 in order to adjust the height and orientation of their end of the head.

It will be apparent therefore that the invention provides a simple device for holding the two halves of the head together and for supporting them, as such device requires simply a pair of plates as shown in Fig. 5 and a pair of springs as shown in Fig. 6 plus bolts therefor. The halves 2 are assembled in obverse relation shown in Fig. 2 by slipping the two plates 20, 26 over the core legs at the opposite ends of the head to thereby hold the halves together with spring tension, such plates being locked in position by their springs like 29 and 30. An adjustable support for the head is provided by the flanges 43, 48 and two bow springs like 51 and their adjusting bolts which mount the head on a panel.

It will be apparent that various modifications may be made in the invention without departing from the spirit of the following claims.

I claim:

1. A magnetic head having a pair of core halves each having a pair of inclined legs and apertured flanges through which said legs extend, the corresponding legs at one side of the core halves fitting together and the corresponding legs at the other side of the core halves being spaced forming a gap, a separator in said gap, the outside of each of said legs of both core halves having a notch and a pair of plates each having an aperture through which the corresponding legs project at opposite sides of the core, respectively, mounted on the adjacent flanges each of said plates having a pair of spaced compression leaf springs each fitting one of said notches of said corresponding legs, the springs of each plate forcing the corresponding legs together, each notch having a wall serving as an abutment for the end of its spring to hold said plates in position.

2. A magnetic head according to claim 1 wherein each of said core halves has a coil, each of said plates fitting across one of the corresponding ends of both of such coils and being held thereon by its said springs.

3. A magnetic head according to claim 1, each of said plates having an angular flange, said flanges serving as supports for the head.

4. A magnetic head mounted on a base and having a magnetic gap, means for orienting said gap axially and angularly with reference to the base comprising a full floating compression spring support for said head, said spring support supporting said head at each end thereof and on opposite sides of the center line through said gap and means engaging said base and support for securing said support in selected oriented positions.

5. A magnetic head formed with a gap, supporting means for said head including spaced plate members, a bow leaf spring support for each plate member mounted on a base, the ends of said springs engaging the respective plate members on opposite sides of a plane common to said gap and the mid portions of the springs, said spring mid portions being supported on said base, and adjusting bolts selectively connecting the ends of said springs and plate members to said base to vary the spacing of said gap from said base.

6. A magnetic head according to claim 5 wherein the adjusting bolts may be differentially adjusted to vary the angular position of said gap with respect to said plane.

EMMANUEL BERLAN. [signature]

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