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MAGNETIC HEAD CONSTRUCTION

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*Fig. 2.*

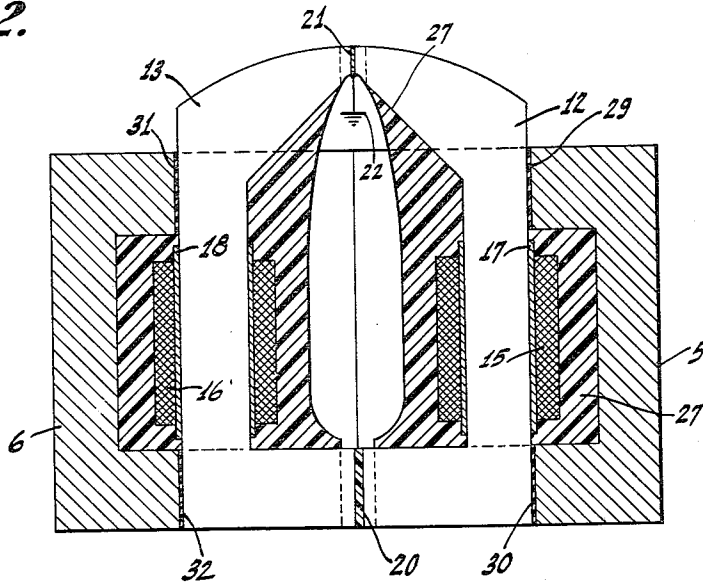
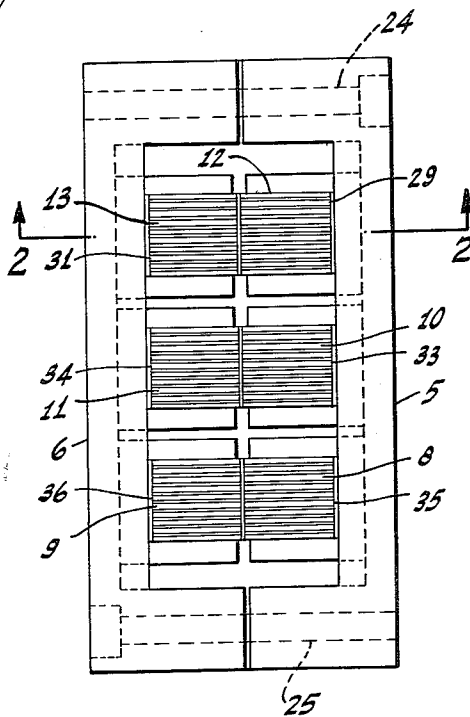


*Fig. 1.*



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3,079,467  
**MAGNETIC HEAD CONSTRUCTION**  
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7 Claims. (Cl. 179-100.2)

This invention relates to magnetic head constructions, and particularly to a construction to provide a magnetic head with improved recording characteristics.

In my United States Patent No. 2,756,280, of July 24, 1956, I disclosed a multiple magnetic head structure of the coaxial ring type for multiple track recording. In this general type of construction, the cores of the magnetic heads are positioned in contact with a supporting structure of brass or aluminum, which, in turn, is grounded in any suitable manner, such as by connection to the shields of conductors. Such a head construction has certain characteristics with respect to the amount of bias current required and the amount of eddy current losses.

The present invention is directed to a head in which the specific construction thereof reduces the eddy current losses, thus reducing the bias current required for optimum operation and increasing the high frequency response. These improvements are accomplished by the use of a thin plastic or hard aluminum oxide layer positioned between the core and the brass or aluminum support, preferably aluminum. The hard aluminum oxide layer may be produced by a chemical reaction. To obtain a ground, the beryllium copper front gap spacer is grounded.

The principal object of the invention, therefore, is to improve the operation of magnetic recording heads.

Another object of the invention is to provide an improved construction of a magnetic recording head.

A further object of the invention is to provide an improved multiple magnetic head unit.

A better understanding of this invention may be had from the following detailed description when read in connection with the accompanying drawings, in which:

FIG. 1 is a plan view of a triple head construction embodying the invention; and

FIG. 2 is a cross-sectional view of the multiple head unit shown in FIG. 1 and taken along the line 2-2 of FIG. 1.

Referring, now, to the drawings in which the same reference numerals identify the same elements, the magnetic head unit includes a pair of U-shaped core supports 5 and 6 of either brass or aluminum, preferably aluminum. Between the supports 5 and 6, closely adjacent to the open sides of the respective U-shaped core supports 5 and 6, as clearly shown in the drawing, are core sections 8, 9, 10, 11, 12, and 13. Around each of the core sections is a winding, such as shown at 15 and 16 in FIG. 2, the windings being interconnected and connected to a signal source. Between the windings 15 and 16 and core sections 12 and 13 are layers of paper insulation 17 and 18, respectively.

The rear ends of the respective core sections 12 and 13 are separated by a plastic spacer 20, while the front or signal gap between each pair of cooperating core sections is formed by a beryllium copper spacer 21, which is grounded in any suitable manner as shown at 22. The spacer could be grounded directly to the supports 5 and 6 if desired. The entire unit is held together by screws 24 and 25 in the end sections of the core supports 5 and 6. The openings between the core sections 12 and 13 and between the supports 5 and 6 and the coils 15 and 16 are filled with a plastic resin 27 in the usual manner.

The important feature of the above construction, which

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reduces the bias current required for optimum operation and improves the high frequency response by reducing the eddy current losses in the core supports, is the use of thin layers 29, 30, 31, 32, 33, 34, 35, and 36 of plastic or aluminum oxide between the closely adjacent areas of the supports 5 and 6 and the core sections 8 to 13, inclusive. The thickness of these layers is of the order of one-half thousandth of an inch. The use of aluminum oxide is preferred as it provides a particularly hard coating which aids in maintaining the gaps of the multiple heads accurately in line. By the use of non-magnetic metal core supports, greater strength is provided and the supports can be used over again.

I claim:

1. A magnetic head structure comprising a pair of electrically conductive, U-shaped core supports, a pair of magnetic U-shaped cores positioned between said core supports, said cores and said supports being completely spaced from each other but being disposed in closely adjacent relation to each other at certain areas thereof, a winding on each of said cores, a grounded gap spacer between said cores, and a layer of insulation between said cores and said support at each of said areas.

2. A magnetic head structure in accordance with claim 1 in which said gap spacer is of beryllium copper and wherein said supports are of aluminum and said insulation is a layer of aluminum oxide thereon.

3. A magnetic head structure in accordance with claim 1 in which said gap spacer is of beryllium copper and said insulation is a plastic.

4. A magnetic head structure comprising a magnetic core having a gap end, a winding on said core, a grounded gap spacer in said core at said gap end thereof, a metallic support for said core, said core and said support being completely spaced from each other but being disposed in closely adjacent relation to each other at certain areas thereof, and at least one layer of insulation between said core and said support at each of said areas.

5. A magnetic head structure in accordance with claim 4 in which said support comprises a pair of U-shaped members of aluminum, one on each side of said core and separated from said core by at least one layer of aluminum oxide thereon.

6. A magnetic head structure comprising a core having a signal gap, a winding on said core, a metal support for said core, said core and said support being completely out of contact with each other whereby they do not touch each other but being disposed in closely adjacent relation to each other at certain areas thereof, and insulating means between said support and said core at said areas engaging both said core and said support.

7. A magnetic head structure in accordance with claim 6 wherein said insulating means has a thickness of the order of one-half thousandth of an inch.

## References Cited in the file of this patent

### UNITED STATES PATENTS

|           |              |               |
|-----------|--------------|---------------|
| 2,536,272 | Friend       | Jan. 2, 1951  |
| 2,628,286 | Rettinger    | Feb. 10, 1953 |
| 2,756,280 | Rettinger    | July 24, 1956 |
| 2,769,036 | Selsted      | Oct. 30, 1956 |
| 2,769,866 | Kornei       | Nov. 6, 1956  |
| 2,839,614 | Merrill      | June 17, 1958 |
| 2,861,134 | Gernert      | Nov. 18, 1958 |
| 2,868,889 | Patterson    | Jan. 13, 1959 |
| 2,888,541 | Netzer       | May 26, 1959  |
| 2,895,015 | Zenel et al. | July 14, 1959 |
| 2,950,355 | Moehring     | Aug. 23, 1960 |