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MAGAZINE TYPE MAGNETIC RECORDING APPARATUS

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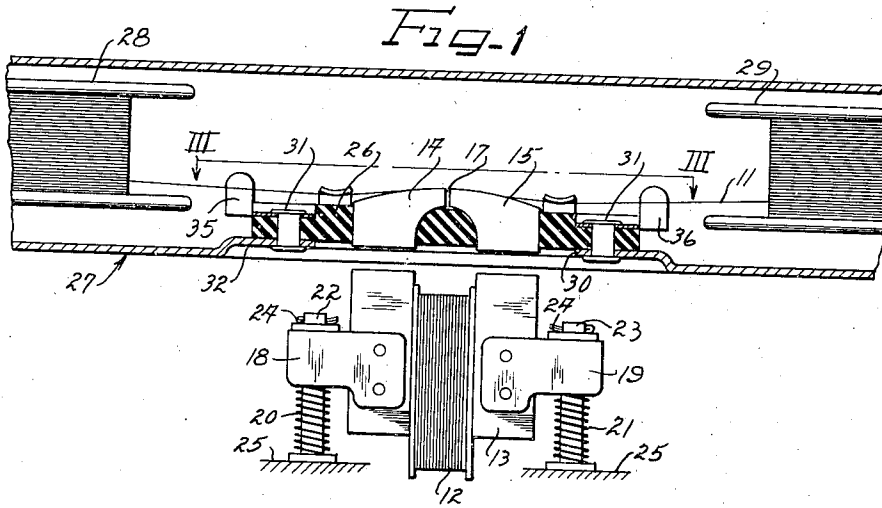


Fig-2

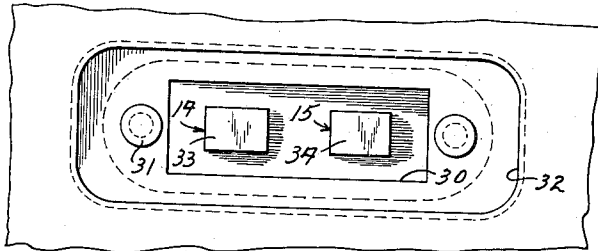


Fig-3

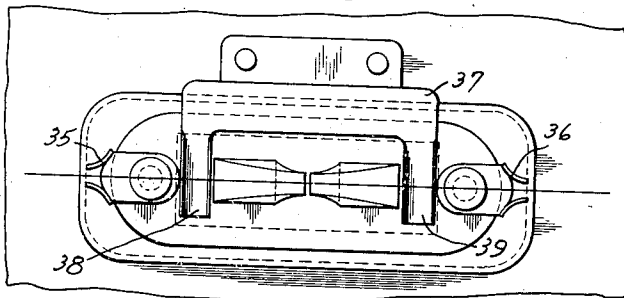
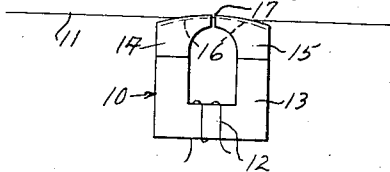


Fig-4



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## UNITED STATES PATENT OFFICE

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MAGAZINE TYPE MAGNETIC RECORDING  
APPARATUS

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5 Claims. (Cl. 179—100.2)

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This invention relates to a magnetic recording device and more particularly to a novel magazine and head construction for a magnetic recording device.

Magnetic recording devices as being designed at the present time contemplate the use of a magazine which will house the magnetic record medium and which will eliminate the necessity of the user of the device having to handle the wire or other record medium when he uses the machine or when he desires to change records. It is generally felt that the magazine containing the wire should have as few operating parts therein as possible in order to keep the cost down since this will encourage the wide-spread use of magazines and will enable the owner of a magnetic recording device to have a large library of records. While the simplest form of a magazine would be merely a can with two spools of wire in it and a large opening so that the magnetic recording head on the main machine could be moved up against the wire and into the magazine, such a magazine has the disadvantage that it is not dust-proof and tends to collect foreign material. On the other hand, a magazine might be employed having the recording and reproducing heads housed within the magazine and switch parts thereon to make electrical connection when the magazine is placed on the machine. Such a construction tends to increase the cost of the magazine substantially and at the same time has the objectionable feature of having a large number of electrical contacts to be made. Such contacts, when a low impedance head is employed, will greatly increase the resistance of the circuit to the recording head due to the contact resistance and the construction becomes impractical.

One of the principal features and objects of the present invention is to provide a structure in which the electrical portion of the magnetic recording head is on the main machine but wherein the pole tips are housed within a dust-proof magazine and in constant engagement with the wire or other recording medium.

Another object of the present invention is to provide a novel mechanism which overcomes the difficulties expressed above and yet retains substantially all of the desired advantages.

A further object of the present invention is to provide a novel magnetic head structure in which the magnetic core of the head structure is separable from the portion having the electric winding.

Another and further object of the present invention is to provide a novel magazine for mag-

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netic recording and reproducing devices which includes the pole tip portion of the recording and reproducing head but which does not include the portion containing the electric coil.

Another and further object of the present invention is to provide a novel magazine and recording and reproducing head in which the pole tip portions are contained within a dust-proof magazine and which are arranged to be placed in juxtaposition with the remaining magnetic core portion of the recording head so as to complete the magnetic circuit when the magazine is moved into position on a magnetic recording or reproducing device.

The novel features which are believed to be characteristic of my invention are set forth with particularity in the appended claims. My invention itself, however, both as to its manner of construction and method of operation, together with further objects and advantages, may best be understood by reference to the following description, taken in connection with the accompanying drawings, in which:

Figure 1 is a fragmentary view partly in section of a magazine and a recording and reproducing head embodying the novel features and principles of the present invention;

Figure 2 is a fragmentary bottom view of the magazine showing the manner in which the base of the pole tips extend out of the bottom of the dust-proof magazine;

Figure 3 is a view taken along the line III—III of Figure 1 looking down on the top of the pole tip portion within the magazine; and

Figure 4 is a diagrammatic illustration of the magnetic recorder head with its pole pieces in place and with a traveling record medium passing through the head.

The particular embodiment of the present invention illustrated in the various figures of the drawings includes a magnetic recording and/or reproducing head 10 which is arranged to receive and guide a traveling record medium 11 (see Figure 4 of the drawings). This magnetic recording and/or reproducing head includes an electrical coil 12 wound on a U-shape core-piece 13 which is formed of any suitable magnetic material having relatively high initial permeability. The magnetic circuit of the recording and reproducing head, in addition to the U-shaped core piece 13, also includes pole portions 14 and 15 which are separable from the core piece 13. The pole pieces 14 and 15 and the U-shaped core piece 13 together make up the complete core 10 for the coil 12. The upper surface of the poles 14 and 15

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are slotted as at 16 to receive and guide the traveling record medium through the non-magnetic gap 17 which lies between the poles 14 and 15.

The U-shaped core piece 13 and the coil 12 are supported on arms 18 and 19 secured to the core piece 13 and supported on springs 20 and 21. Guide pins 22 and 23 extend up through the arms 18 and 19, cotter pins 24 or the like being provided to retain the arms 18 and 19 on the pins or posts 22 and 23. The posts 22 and 23 are mounted on the fixed structure of the magnetic recording device which is diagrammatically represented at 25.

The poles 14 and 15 are carried in an insulating block 26 which forms part of the wall of a magazine 27. The magazine 27 is preferably formed of a stamping of sheet metal or the like. This metal magazine completely encloses the wire spools 28 and 29 which carry the traveling record medium 11. The only opening in the metal magazine (other than the bearing and shaft connections to the spools 28 and 29) is the opening 30 which is completely covered by the insulating block 26. It will thus be understood that the magazine 27 is substantially dust-proof and foreign and extraneous matter cannot work itself into the same. The insulating block 26 may be secured to the metal shell of the magazine 27 in any suitable manner such, for example, as by rivets 31. The portion of the magazine 27 immediately adjacent the insulating block 26 is indented or depressed as at 32 so as to facilitate stacking of a number of magazines together and to prevent damage to the butt ends 33 and 34 of the pole pieces 14 and 15.

Mounted on the interior of the magazine are wire guides 35 and 36 as well as a bracket 37 having wire hold-down fingers 38 and 39. The fingers 38 and 39 keep the wire properly seated in the slot 16 in the pole pieces 14 and 15.

When the magazine 27 is to be used on the machine it is moved into position so as to cause the butt end portions 33 and 34 of the pole pieces 14 and 15 to abut the complementary legs of the core portion 13. While there is some increase in the reluctance of the magnetic path in the core at the surfaces where the pole pieces 14 and 15 abut the core piece 13, this is relatively small compared with the reluctance of the non-magnetic gap 17. It will therefore be apparent that substantially all of the M. M. F. drop will be across the non-magnetic gap 17. When it is desired to make a recording on the wire 11, the coil 12 is energized by fluctuating electric energy and the wire 11 is longitudinally magnetized in accordance with the signals being impressed on the coil 12. When the wire 11 already has a recording thereon, the fluctuating magnetic field set up by the traveling record medium crossing the non-magnetic gap 17 induces an electro-motive force in the coil 12 which varies as the signal originally impressed on the wire 11.

No specific means has been shown for retaining the magazine in place since such securing means forms no part of the present invention. It will, however, be understood that the magazine will be held and retained in place when moved into position against the core piece 13. The core piece 13 is resiliently mounted on the coil springs 20 and 21 in order that the core piece 13 may be resiliently pressed against the butt ends 33 and 34 of the pole pieces 14 and 15 when the magazine is moved into position. This improves the contact between the pole pieces 14 and 15 and the

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core piece 13 and thereby tends to keep the reluctance at this point of surface contact at a minimum in the magnetic path.

No specific means has been shown for level winding the wire within the magazine 27 since this, too, forms no part of the present invention. This may, of course, be done by simply moving the spools back and forth along their own axis within the magazine 27, or in any other suitable manner. The wire guides 35 and 36 and the fingers 38 and 39 facilitate keeping the wire in its proper place in the pole pieces 14 and 15 when said level winding operation takes place.

While I have shown a particular embodiment of my invention, it will, of course, be understood that I do not wish to be limited thereto, since many modifications may be made, and I, therefore, contemplate by the appended claims, to cover all such modifications which fall within the free spirit and scope of my invention.

I claim as my invention:

1. In a machine for the reproduction of recordings of signals, a magazine having a record medium therein and a pair of pole pieces in contact with which the record medium is arranged to travel, and a signal coil having a core with projecting leg portions, said magazine being arranged to be seated on said machine with the bases of said pole pieces in close proximity to said leg portions.

2. In a machine for the reproduction of recordings of signals, a magazine having a record medium therein and a pair of pole pieces in contact with which the record medium is arranged to travel, and a signal coil having a core with projecting leg portions, said magazine being arranged to be seated on said machine with the bases of said pole pieces in abutting relation with the ends of said leg portions.

3. In a machine for the reproduction of recordings of signals, a magazine having a record medium therein and a pair of pole pieces in contact with which the record medium is arranged to travel, a signal coil having a core with projecting leg portions, said magazine being arranged to be seated on said machine with the bases of said pole pieces in abutting relation with the ends of said leg portions, and resilient means for urging said leg portions toward the base of said pole pieces.

4. In a machine for the reproduction of recording of signals, a magazine having a record medium therein and means for causing said record medium to travel from one side to the other of said magazine, said magazine also having a pair of salient pole pieces mounted therein with a nonmagnetic gap therebetween, said record medium being arranged to travel across said non-magnetic gap, said machine also having a coil with a core having projecting leg portions, said magazine being arranged to be seated on said machine with the bases of said pole pieces in close proximity with said leg portions.

5. In a machine for the reproduction of recordings of signals, a magazine having a record medium therein and means for causing said record medium to travel from one side to the other of said magazine, said magazine also having a pair of salient pole pieces mounted therein with a non-magnetic gap therebetween, said record medium being arranged to travel across said non-magnetic gap, said pole pieces having base portions extending through the wall of said magazine, and a signal coil having a core with projecting leg portions, said magazine being arranged to

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be seated on said machine with the projecting base portions of said pole pieces in abutting relation with the ends of said leg portions.

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