July 12, 1932. F. SCHROETER 1,867,179

TELEGRAPHONE

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Fig. 1

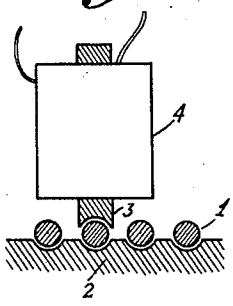
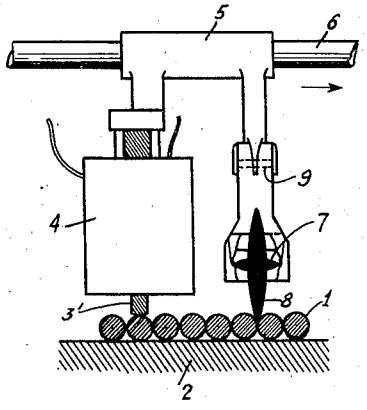



Fig. 2




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# UNITED STATES PATENT OFFICE

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## TELEGRAPHONE

Application filed October 9, 1930, Serial No. 487,461, and in Germany November 19, 1929.

The present invention relates to telegraphones, or similar devices for recording and reproducing sound by the use of a magnetized steel wire or steel band.

The object of this invention is to simplify telegraphone apparatus.

In accomplishing this invention the steel wire is laid or wrapped in uniform turns or spires upon the surface of a cylindrical carrier or support which support is caused to rotate at a uniform rate of speed in relation to the working magnet while the latter is shifted parallel to the axis of rotation by the amount of the pitch of one turn for each rotation.

In one usual well-known arrangement of this kind, the turns of the steel wire are wrapped a certain distance apart upon the supporting member. It is possible to afford guiding means for the adequately hollowed pole of the working magnet, which embraces or surrounds the wire sufficiently far so that it is thereby axially displaced as the cylinder is revolved. All that is necessary for this purpose is to support the magnet on a device adapted to be shifted upon a guide rod parallel to the axis of rotation. By this arrangement, as will be seen, a distinct screw spindle including gearwheel transmission, etc., for the forward shift of the working magnet is dispensed with.

The gaps which are required between the turns of the steel wire in order to allow the magnet pole to embrace the wire to an adequate extent without strays being produced towards the adjacent turns, however, necessitate the sound record bearer being unnecessarily large.

It is the more particular object of this invention to overcome the above noted disadvantage.

This object is accomplished by actuating the magnet carrier, not by the actual turn of the wire which is cooperating with the magnet, but by the grooves between two remote turns of the wire, in which groove a small guide wheel, connected to the magnet carrier, is adapted to ride.

Having thus briefly described the features embodying my invention, attention is invited to the accompanying drawing in which:

Fig. 1 shows the usual form of magnet carrier actuating system as described above, and;

Fig. 2 shows the magnet carrier actuating system constituting my invention.

Attention is now particularly invited to Fig. 1, which is drawn to an exaggerated scale. In this figure the turns of steel wire 1 are shown in cross-section, as wrapped a certain distance from one another upon the supporting member 2. The pole 3 of the working magnet 4 has its face hollowed so that it is adapted partially to embrace a turn of the wire 1. Thus as the cylinder 2 revolves, the wire causes the lateral movement of the pole 3. The magnet is capable of axial displacement, being mounted upon a guide rod (not shown) extending parallel to the axis of rotation.

Attention is now invited to Fig. 2, in which the turns of the steel wire 1 are laid as close together as feasible to reduce the space occupied and at the same time reduce the cross-section of the wire to a minimum. It is no longer feasible to form the pole 3′ in the way shown in Fig. 1, inasmuch as accurate guiding as indicated in connection with Fig. 1 is no longer possible on account of the close proximity of the wire turns. Further, because of the close proximity of the turns of wire, harmful strays would occur. The pole 3′ is formed as shown in Fig. 2. It is arranged to bear upon a narrow zone, the wire being scanned or explored or it may be merely positioned close to the turn of the wire being so explored.

Now, to actuate the working magnet 4, accurately in a direction parallel to the axis of rotation of the cylindrical steel wire carrier 2, I have provided a sleeve 5 sliding upon a guide rod 6, associated on the one hand with the working magnet 4, while being connected on the other hand by means of a link 9 with a bearing 7. In the bearing a small sharp-edged guide wheel 8, seated upon the grooves of the wire winding is rotationally supported between points. The connection between the guide wheel 8 and

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the working magnet 4 is rigid in the direction of motion, while in the plane at right angles thereto, a relative motion is feasible by virtue of the link 9 between the wheel 8 and the pole 3 so that in this slight irregularities or uneveness between the different turns can be accommodated. If very carefully built and if it preserves its shape properly the carrier member 2 can be operated without the link 9, and it may be replaced by a rigid connection.

The sharp edge of the small wheel 8 which is made of non-magnetic material, permits such accurate guiding that the magnet will always be properly actuated without embracing the wire turns or indeed while separated by a certain distance therefrom. Therefore, in spite of the close position and of the small diameter of the steel-wire spires, it will not be necessary to provide a screw-spindle conveyance or shifting means for the magnet so that the considerable cost thereof can be saved.

By the symmetric arrangement of the guide rod between two similar alternately operating steel-wire carriers, the present arrangement, furthermore, permits of turning the working magnet 4 from one towards the other.

In place of the small guide wheel 8 shown in Fig. 2, it is also possible to provide some other suitable element such as a needle-like pin or blade whose sharp point is made to slide in the groove of the turns. Furthermore, the guide element need not be arranged laterally in reference to the working magnet. It could also be positioned in the center line of its pole on the opposite side of the wire carrier so that the small wheel 8 is able to engage in the neighboring groove of the turn that has just been explored.

I claim:

1. A telegraphone arrangement which comprises in combination a cylindrical sound record carrier adapted to be rotated at a uniform speed, a plurality of turns of magnetizable wire closely disposed on the surface of said carrier, a guide rod disposed parallel to the axis of said carrier, a sleeve adapted to slide on said guide rod, a working magnet adapted to be supported by said sleeve, a pole piece for said magnet adapted to be supported adjacent various turns of said wire, a link member adapted to be carried by said sleeve member, and a guide member pivotally mounted on said link member, adapted to operate in the groove between the turns of wire so as to move the sleeve member relative to said carrier member in the direction of its axis, and thus move the working magnet and its pole piece to keep it adjacent a turn of the wire as the carrier member rotates.

2. A telegraphone arrangement which includes in combination, a carrier member having a plurality of turns of magnetizable recording wire wound thereon, a magnet, slidable means for supporting said magnet adjacent one of the turns of said wire, and means for actuating said magnet to progress in the line of the axis of said wire carrier, comprising a guide member connected to said magnet supporting member and adapted to co-act in the grooves between adjacent turns of said wire.

3. In a telegraphone of the type utilizing a drum upon the surface of which is disposed the magnetizable wire, pick-up means adapted to be supported adjacent a turn of said wire and slidably disposed relative thereto, and means for actuating said pick-up member to move it in the line of the axis of said carrier member as the latter rotates, said actuating means including means for cooperating with the groove between two adjacent turns of the magnetizable wire and thus move the pick-up means as the carrier means rotates.

4. In a telegraphone of the type utilizing a carrier upon which is wound a plurality of turns of magnetizable wire, actuating means for the pick-up or recording means, which comprises a separate guide member adapted to be actuated by the groove between two adjacent turns of the magnetizable wire.

5. Arrangement for telegraphones comprising turns of wire wrapped upon a cylindrical sound record carrier subject to a uniform speed of rotation, characterized by gapless adjoining of the turns and the connection of the working magnet with a sharp pointed or sharp edged guide body which is made to slide in the groove between the turns of the wire and which thus transfers a pull upon the magnet in the direction of the axis for the purpose of insuring axial displacement or shift.

6. Arrangement according to claim 5, characterized by the feature that a link is inserted in the connection between the guide member and a bush adapted to slide upon a smooth guide rod and associated with the recorder magnet.

7. In a telegraphone of the type utilizing a carrier upon which is wound a plurality of turns of magnetizable wire, actuating means for the pick-up or recording means, which comprises a separate guide member adapted to be actuated by a turn of wire non-adjacent to the pick-up recording means.

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