

Nov. 28, 1939.

G. E. PERREAULT

2,181,707

POLE PIECE FOR MAGNETIC TELEGRAPHERS

Filed March 12, 1938

FIG. 1

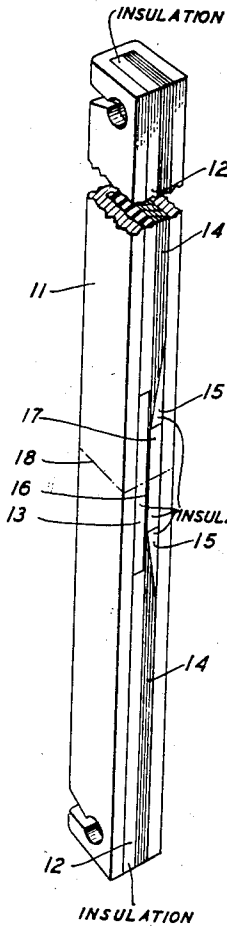


FIG. 2

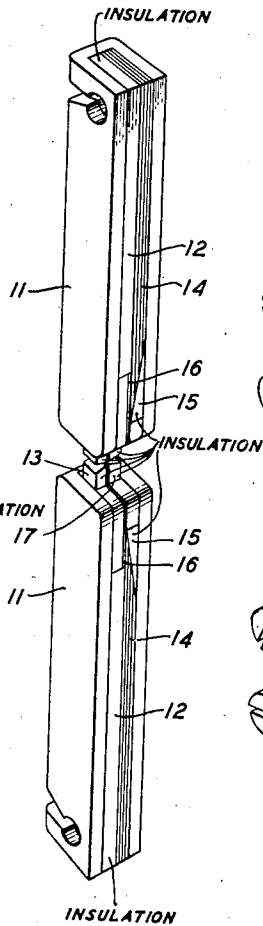


FIG. 3

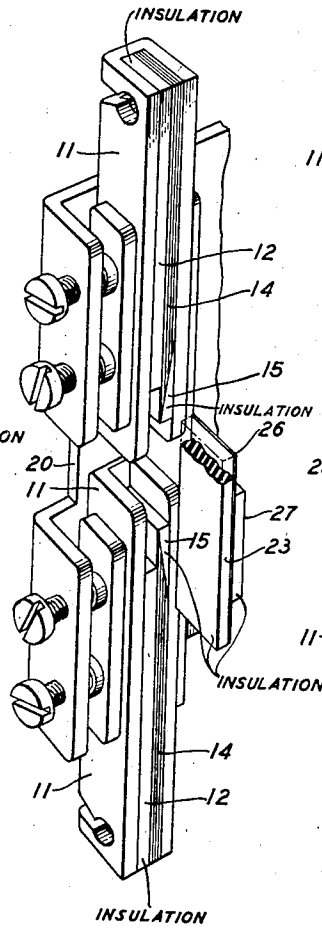
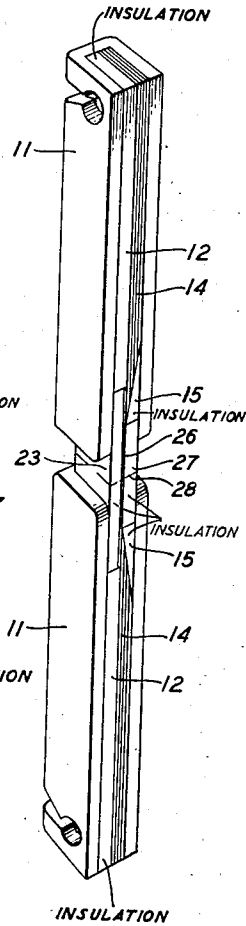


FIG. 4



INVENTOR
G. E. PERREAULT
BY *G. M. Campbell*
ATTORNEY

UNITED STATES PATENT OFFICE

2,181,707

POLE PIECE FOR MAGNETIC
TELEGRAPHOES

George E. Perreault, Bronxville, N. Y., assignor
to Bell Telephone Laboratories, Incorporated,
New York, N. Y., a corporation of New York

Application March 12, 1938, Serial No. 195,429

4 Claims. (Cl. 179-100.2)

This invention relates to pole pieces for magnetic telegraphones and the object of the invention is to reduce the cost and increase the effective life of such pole pieces.

It is, of course, well known that for efficient recording and reproduction these pole pieces should be of very high permeability and in this respect very good results have been obtained by disposing within a non-magnetic shell a plurality of thin laminations of carefully heat treated magnetic material, the laminations being placed so that the pole piece tapers to a thin tip which is supported laterally by non-magnetic material to provide an enlarged wearing surface.

Great care must be used in treating the laminations and in assembling them in the shell for if they are stressed appreciably their permeability is greatly reduced and the finished pole piece will be correspondingly less efficient. These pole pieces are therefore quite expensive to manufacture and since the tip portion soon becomes worn with use their useful life is rather short. While it is possible to recondition the tips by careful machining this procedure is objectionable from an operating standpoint since it involves a change in mechanical adjustments for each particular length of pole piece. Moreover, since the excess length of the tip lamination is necessarily very short this method of retipping soon brings the lateral laminations into contact with the tape and the telegraphone then is no longer responsive to high frequencies.

According to this invention the pole piece tip which engages the record member comprises a short thin lamination held in place within the shell by suitable spacing blocks in the usual manner and extending back from the pole face only far enough to contact the other laminations of the pole piece. When this pole tip becomes worn the tip lamination and its supporting blocks may be removed and new parts substituted to form a reconditioned pole piece without disturbing the body portion of the assembly.

As explained in detail in Patent 2,003,968 to Hickman, pole pieces of the laminated type are preferably assembled in pairs and then cut apart to form accurately matched companion pole pieces. This accuracy of alignment of the pole tips of the two pole pieces may be preserved in the reconditioning operation by removing the worn parts, mounting the pole pieces in a suitable jig and reassembling the pole pieces as a unitary structure which is then cut in two as before.

According to another feature of the invention,

the cost of such pole pieces may be further reduced by manufacturing them in the first instance with additional laminations disposed on only one side of the tip lamination and filling the other side of the shell with a suitable non-magnetic spacer.

In the drawing,

Fig. 1 is a perspective view of a new pair of pole pieces according to the invention;

Fig. 2 shows the pole pieces with their tip portions cut to final shape;

Fig. 3 shows the worn pole pieces assembled in a jig for reconditioning; and

Fig. 4 shows the reconditioned pole pieces with new tips ready for final shaping as shown in Fig. 2.

Referring now to the drawing, the shell or holder 11 is preferably of brass formed to a U shape, as shown. Phenol fibre spacers 12, 12 and 13 of a thickness equal to one-half the width of the shell are disposed at one side and, for recording and reproducing pole pieces, the remaining half of the shell is carefully filled with laminations of some suitable material, such as molybdenum permalloy, which have been treated to give them a very high permeability. One very satisfactory method of preparing such laminations is described in Patent 1,982,810 to Hickman.

The laminations 14 may be about 6 mil-inches thick tapered at one end to fit tightly against the fibre blocks 15, 15 but the short lamination 16, which is slightly shorter than the block 13, is preferably much thinner and may be from 0.5 to 2.0 mil-inches thick depending on the frequency response characteristic desired for a given tape speed. Since this lamination must conduct the entire signal flux to and from the tape, extreme care must be used to avoid bending or otherwise stressing it in placing it in position between the spacer blocks 13 and 17.

This assembly is then given several coats of thin shellac and baked before cutting it along the line 18 to form the companion pole pieces. The brass housing 11 is then cut back a short distance on each pole piece so that the pole tips protrude slightly as shown in Fig. 2. The wearing faces of the blocks 13 and 17 are then filed off at a slight angle to permit the tip of the lamination 16 to make good contact with the tape. Since the pole pieces will ordinarily be used on narrow tape, which may be of the order of 50 mil-inches in width, it will also be necessary to file off the front and back sides of the protruding pole tip so that the completed tip has a width slightly less

than the width of the tape with which it is to be used. The tip laminations at this time are firmly held between the spacing blocks and hence this shaping can be accomplished without materially affecting their permeability.

When it becomes necessary to replace the tips the remaining portions of the old tip lamination and its supporting blocks or spacers are removed, the two housings are clamped in a suitable jig 20 in accurate axial alignment with the same spacing as in Fig. 2 and a new lamination 26 and supporting and spacing blocks 23 and 27 are inserted. This assembly is then shellacked, baked and cut in two along the line 28 and after shaping the protruding pole tips as before the pole pieces are again ready for use.

This reconditioning technique is, of course, applicable also to polarizing pole pieces but for this purpose, due to the higher flux densities used, the laminations are preferably of iron and may be thicker than those used in the translating pole pieces.

What is claimed is:

1. A pole piece for telegraphones having a replaceable tip portion comprising a short thin lamination of magnetic material and lateral sup-

porting members therefor extending into and secured to the body of the pole piece.

2. A pole piece for telegraphones comprising a body portion of magnetic material, a holder for the material, a short thin lamination contacting the material and extending outwardly to form a pole tip, and removable spacers supporting the pole tip in the holder.

3. A pole piece for telegraphones comprising a holder, magnetic material, a spacing member holding the material at one side of the holder, and a replaceable tip portion comprising a thin magnetic lamination and lateral supports therefor extending into the holder and securing the lamination in contact with the magnetic material.

4. The method of retipping worn telegraphone pole pieces which comprises removing the worn tip portions, securing two such pole pieces in spaced relation and accurate axial alignment, connecting the pole pieces together with a centrally disposed magnetic lamination and lateral supporting members therefor, and cutting the connecting members to form a new pole face for each pole piece.

GEORGE E. PERREAULT.