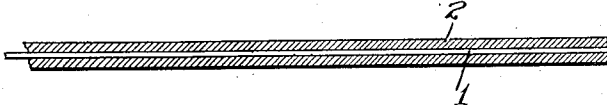


F. L. WOOD.  
PHONOGRAPH NEEDLE.  
APPLICATION FILED JUNE 30, 1915.

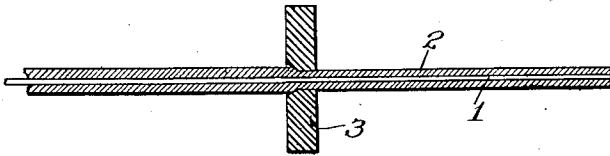
1,246,694.

Patented Nov. 13, 1917.

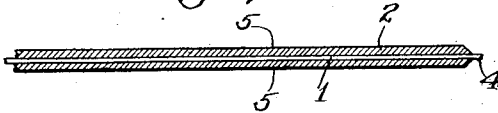
*Fig. 1,*



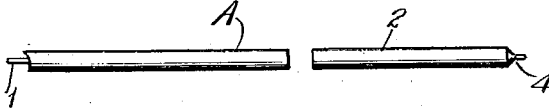
*Fig. 2,*



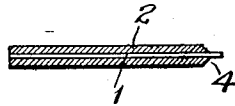
*Fig. 3,*



*Fig. 4,*



*Fig. 5,*



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# UNITED STATES PATENT OFFICE.

FREDERICK L. WOOD, OF MERIDEN, CONNECTICUT, ASSIGNOR TO THE AEOLIAN COMPANY, A CORPORATION OF CONNECTICUT.

## PHONOGRAPH-NEEDLE.

1,246,694.

Specification of Letters Patent. Patented Nov. 13, 1917.

Application filed June 30, 1915. Serial No. 37,228.

*To all whom it may concern:*

Be it known that I, FREDERICK L. WOOD, a citizen of the United States, residing at Meriden, in the county of New Haven and State of Connecticut, have invented certain new and useful Improvements in Phonograph-Needles, of which the following is a specification.

My present invention relates to a novel phonograph needle for use in reproducing sound from sound-records. The advantages of my said needle will be apparent to those skilled in the art from an understanding of the following description in connection with the drawings. In the latter, Figures 1 to 4 inclusive are more or less diagrammatic representations of different stages in the process; and Fig. 5 is a mid-longitudinal section of the finished needle shown in Fig. 4.

In carrying out the invention, I may use for materials a six to eight foot length or so of piano wire having a diameter of about six or seven thousandths of an inch assuming that the needle is to be used to play the lateral cut records generally in use today; also a length of brass or steel tubing about eighty thousandths of an inch in diameter. The tubing may be shorter than the wire because it will extend farther than the wire in the hereinafter described drawing operation. The hole through the tubing is small so that it nicely receives the wire into it. The wire having been inserted entirely through the tubing, the two are brought into union with each other by being subjected to a wire-drawing operation. In Fig. 1, the wire is designated 1 and is shown located inside the tubing 2 preparatory for the drawing operation. In Fig. 2, 3 is the wire-drawing die. The sheath and wire to the right of the die are supposed to have been drawn through it. They are reduced in diameter, elongated and drawn into perfect union with each other. The wire thus becomes perfectly integrated with the sheath to the great benefit of the tonal qualities of the resulting needle. The piano wire is hard to start with; and the metal tubing becomes so, due to the drawing operation, with the result that it is given a finely resonant and other qualities, especially adapting the composite wire for phonograph needles. To this end, annealing is avoided in connection with the

drawing operation or operations. The brass sheath gives a softer playing needle than the steel.

The next step in the manufacture of the needle will be preferably to mill one end of the composite wire to the extent of removing part of the sheath to expose enough of the wire for a record-groove engaging point. This is shown in Fig. 3 where the point is designated 4. Both sheath and wire will then be cut through on the line 5—5 in Fig. 3 to produce the final needle. The result of this step is shown in Fig. 4. The same milling and cutting off operations will then be repeated on the remaining free-end portion A Fig. 4 and so on until the whole length of the composite sheathing and wire is formed into needles.

The tonal quality of these needles is excellent; and their hard drawn piano-wire points are tough, non-breaking, very smooth and uniform in action, and capable of playing a great many records per needle.

Of course, it is possible that certain steps could be practised in the reverse order and other changes might be made in the process or the materials which would still be within the spirit and intent of my invention and these I mean to be covered by the claims.

I prefer to choose my material for the sheath so that after the final drawing operation it will still be sufficiently softer than the piano-wire that a milling tool can be chosen which will cut the sheath to expose the wire-point without cutting the point, this selective action of the tool making it easy and practical to expose said points.

What I claim is:—

1. A phonograph needle comprising a metal sheath filled with a wire, the two having a drawn union with each other, one end of the wire being exposed for a short distance to form the record engaging point.

2. A phonograph needle comprising a metal sheath filled with a wire, the two having a drawn union with each other, said needle having a record engaging point at its end.

In testimony whereof, I have signed my name to this specification this 29th day of June 1915.

FREDERICK L. WOOD.