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A. L. WALTON

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NEEDLE FOR SOUND REPRODUCING INSTRUMENTS

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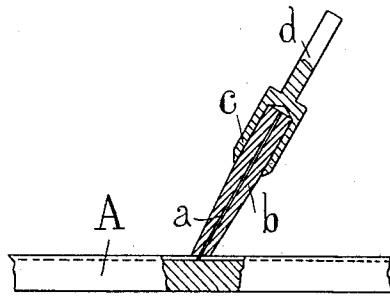


Fig. 1.

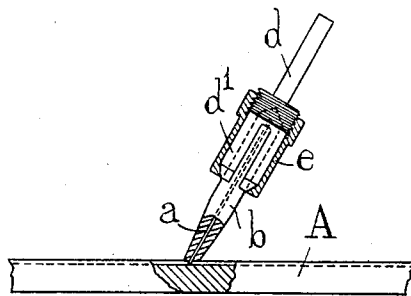


Fig. 2.

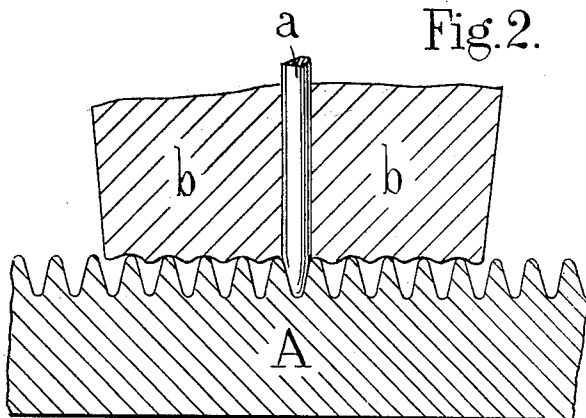


Fig. 3.

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UNITED STATES PATENT OFFICE

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NEEDLE FOR SOUND REPRODUCING INSTRUMENTS

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The invention relates to needles for use in sound reproducing instruments, and is of the type constructed with a fine wire core surrounded by a support of relatively softer material, the wire being adapted to engage the reproducing track of a gramophone record, the softer casing being adapted to lie on and to be ground away by frictional contact with the surface of the record.

In this type of needle the perfect transmission of recorded sound vibrations to the stylus bar and diaphragm of a sound reproducing instrument is dependent upon the supporting material being of sufficient strength and thickness to adequately support the sound box of the sound reproducing instrument; being sufficiently firm to give adequate and continuous support to the fine wire core; transmitting the recorded sound vibrations from the record to the stylus bar and diaphragm without loosening its grip on the wire core and causing a partial loss of such vibrations with consequent imperfect reproduction; and being in such relation to the wire core as regards surface area that the removal of such supporting material by frictional contact with the surface of the record will not interfere with the vibrations at the needle point. I am aware that it has been proposed to use a supporting material of soft metal, but such supporting material does not satisfy the essential conditions in that if made in correct relation to the wire core as regards surface area so that the removal of such supporting material by frictional contact with the surface of the record will not interfere with the vibrations at the needle point, such supporting material is not of sufficient strength and thickness to adequately support the sound box of the sound reproducing instrument. I am also aware that it has been proposed to use a soft or wearable supporting material composed of a combination of graphite, beeswax and resin, but such supporting material also fails to satisfy the essential conditions in that if made sufficiently firm to give adequate and continuous support to the fine wire core and transmit the recorded sound vibrations from the record to the stylus bar and diaphragm without loosening its grip

on the wire core, the removal of such supporting material by frictional contact with the surface of the record interferes with the vibrations at the needle point, causing a partial loss of such vibrations with consequent imperfect reproduction.

The essential feature of my invention lies in the wire core being surrounded by a firm material which satisfies all the required conditions essential to the perfect transmission of recorded sound vibrations to the stylus bar and diaphragm of a sound reproducing instrument, in that the said supporting material gives the fine wire core rigid and continuous support, and is yet sufficiently soft to be easily removed by frictional contact with the surface of the record of a sound reproducing instrument.

According to the invention the needle comprises a fine, hard wire adapted to engage the reproducing track of a gramophone record, and a supporting material which is composed of clay, china clay, or a composition of graphite and china clay, kilned, calcined or baked hard to give the desired firmness and wearing properties.

The said wire and supporting material may be adapted to be mounted direct into the needle socket of the sound box of a sound reproducing instrument, or may be carried in a chuck provided with a shank adapted to be held in the needle socket of the sound box of a sound reproducing instrument.

The invention will be fully described with reference to the accompanying drawing, in which, for clearness, the needle is drawn to an enlarged scale.

Fig. 1 is an elevation part in section of one form of the invention.

Fig. 2 is an elevation partly in section of another form.

Fig. 3 is a diagrammatic sectional elevation of the needle and record.

The wire *a* is of a gauge sufficiently fine to lie within the sound groove of a gramophone record, and is of hardened steel or alloy embedded in and supported by a support *b* composed of clay, china clay, or a composition of graphite and china clay, kilned, calcined or baked hard to give the desired firm-

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ness and wearing properties, the graphite serving as a lubricant between the needle and the record A when the said graphite is worn away by frictional contact with the record.

5 The support *b* is shown fitted into a cylindrical chuck *c* provided with a shank *d* adapted to be held in the needle socket of the sound box of a sound reproducing instrument.

In the form shown in Fig. 2, the needle
10 comprised of the fine wire *a* and calcined support *b* is gripped in a split chuck *d* over which a tapering cap *e* is secured to hold it firmly by releasing the cap *e* the needle may be withdrawn from the chuck and its length
15 adjusted as required.

The needle is applicable for use on records having a laterally sinusoidal groove or of the "hill and dale" type as the supporting material is ground away by frictional contact with
20 the sides or bottom of the grooves of the record as necessary due to the wear of the wire *a* and does not interfere with the vibrations of the needle.

What I claim as my invention and desire
25 to protect by Letters Patent is:—

1. A needle for use in sound reproducing instruments comprising a fine hard wire core to engage the reproducing track of the gramophone and a casing of calcined material
30 to rigidly support the core and be worn away by frictional contact with the surface of the record.

2. A needle for use in sound reproducing instruments comprising a fine hard wire
35 core to engage the reproducing track of the gramophone and a casing of calcined china clay to rigidly support the core and be worn away by frictional contact with the surface of the record.

40 3. A needle for use in sound reproducing instruments comprising a fine hard wire core to engage the reproducing track of the gramophone and a casing of a combination of graphite and china clay calcined and
45 baked hard together, to rigidly support the core and be worn away by frictional contact with the surface of the record.

In testimony whereof I have hereunto set
50 my hand.

ALFRED LEONARD WALTON.

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