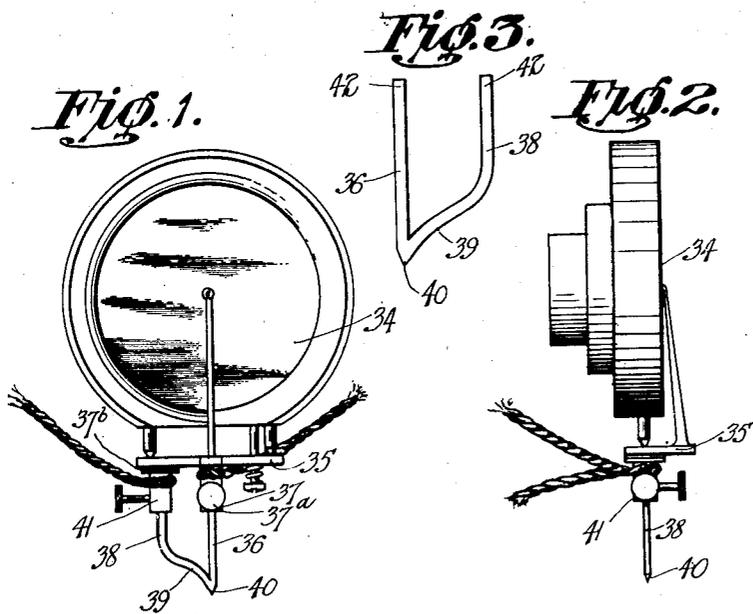


Nov. 22, 1927.

1,649,847

V. C. J. NIGHTINGALL
MEANS FOR RECORDING SOUND

Filed Sept. 4, 1924



Inventor
V. C. J. Nightingall
by Langner, Perry, Ward & Langner
Attys

UNITED STATES PATENT OFFICE.

VICTOR CHARLES JOHN NIGHTINGALL, OF HEIDELBERG, NEAR MELBOURNE,
VICTORIA, AUSTRALIA.

MEANS FOR RECORDING SOUND.

Application filed September 4, 1924, Serial No. 735,953, and in Australia March 20, 1924.

This invention refers to means for the recording of sound on blank discs or cylinders, endless bands or ribbons and has for its object to provide a considerable advance in this art, such advance being characterized by cheapness in production, the elimination of several costly and involved steps at present necessarily employed thereby expediting the production of records in a marked degree.

For convenience of description and illustration I will describe my invention as for use with recording surfaces of the disc type.

Sound records are ordinarily made or inscribed on wax disks sufficiently soft to yield to the vibration of the recording device. Such a disk is too soft for direct use in making duplicate so that an electro-plate is made from it for reproduction purposes. The present invention seeks to avoid the necessity and expense of making the electro-plate, and with this object in view, it proposes to record the sound directly upon a disk sufficiently hard to be repeatedly subjected to the stylus of the reproducing device without deterioration.

The invention relates particularly to a heated recording stylus which softens its path on the relatively hard record enabling the latter to take the impress of the sound vibrations.

Figure 1 is a front view of a stylus and diaphragm embracing this invention.

Figure 2 is a side elevation thereof.

Figure 3 is a view showing stylus.

When applying the invention to disc records for gramophones, the diaphragm 34 is connected to a tone arm 26 and has connected thereto an insulated bridge piece 35 so that one arm 36 of a stylus may be placed in the holder 37 where the needle in a sound box is usually placed, the arm 38 having been previously bent as at 39 to form a point 40 where the two arms join the point 40 projecting in the same position to that which the needle would occupy in a recording sound box.

The arm 36 as above described passes into the holder 37 and is retained therein by means of the screw 37^a whilst the arm 38 passes into the holder 41 which is insulated by means of mica washers 37^b from the bridge piece 35.

The point 40 of the stylus is ground or otherwise shaped to form the desired depth

and breadth of track upon the recording surface described and on the heated stylus and diaphragm 34 being placed on a machine constructed for the purpose as herein described in reference to Figure 7 and motion given to the tone arm 26 by suitable appliances as described, it is obvious that under ordinary conditions a helical track will be formed laterally on the face of the blank 5 as herein described in reference to the ordinary type of reproducer, and the helical track thus formed provides the mechanical traversing means for pulling a tone arm, diaphragm and fitments across the record for the reproduction of sound.

The cutting stylus or needle being in position is then heated in any suitable manner which will permit of localizing and maintaining the maximum heat at the point 40 of track-forming stylus and although various methods of applying heat to obtain this essential result may be attempted it is preferred to use electrical energy and cause it to flow from one end 42 of the stylus arm 38 through the actual point 40 and to the other side 36 thus permitting the greatest heat energy being delivered at the actual cutting point of the stylus.

The cutting point 40 having been made slightly less in cross section than the arms 36 and 38 of the stylus, the point 40 will therefore offer more electrical resistance to the heating current and will be the hottest point of the stylus, the dimensions of the point 40 and the arms 36 and 38 being so proportioned that when the point 40 is at a temperature of about 1000° Fahr. the supporting arms 36—38 are at a much lower temperature that will allow them to retain their hardness for the mechanical purpose of supporting the heated point 40 while functioning on the recording surface.

The electrical energy so flowing causes the point 40 to become heated and by adjusting to a temperature closely related to the temperature at which the blank 5 becomes plastic and causing this track forming stylus to move in contact with the surface of the now-revolving blank 5, on speaking, singing or otherwise causing sound vibrations to flow into a suitably constructed voice focussing device or funnel as 44, a record of the sound waves will be faithfully engraved upon the recording surface which may immediately be transferred to a talking

machine and the voice or other sound reproduced.

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

1. Means for carrying out the process of recording sound vibrations upon a blank by a heated stylus comprising a diaphragm responsive bridge-piece, electric connectors insulated from one another and supported by said bridge-piece said connectors being the terminals of an electric circuit, and a stylus having arms removably attachable to said connectors for closing the circuit through said stylus.
2. Means for carrying out the process of recording sound vibrations upon a blank with a heated stylus, comprising an electrically conductive diaphragm-responsive bridge piece, electric connectors, one grounded upon said bridge piece and the other insulated therefrom, said connectors being the terminals of an electric circuit, a stylus having arms coacting with said connectors, and means for removably securing said stylus to said connectors.

Signed at Melbourne, Victoria, Australia.

VICTOR CHARLES JOHN NIGHTINGALL.