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1,784,845

PHONOGRAPH NEEDLE

Filed Oct. 4, 1928

FIG. 1.

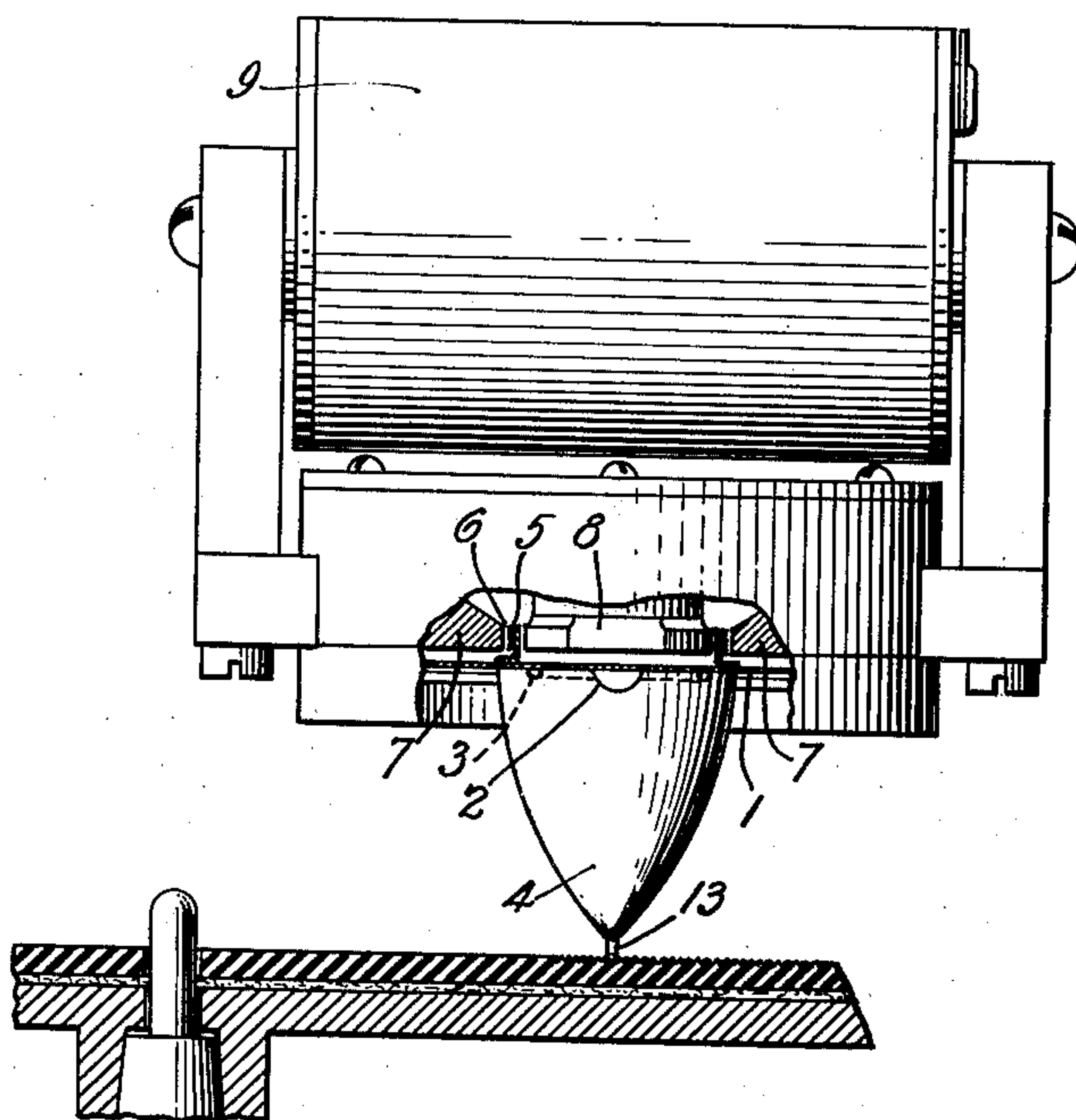
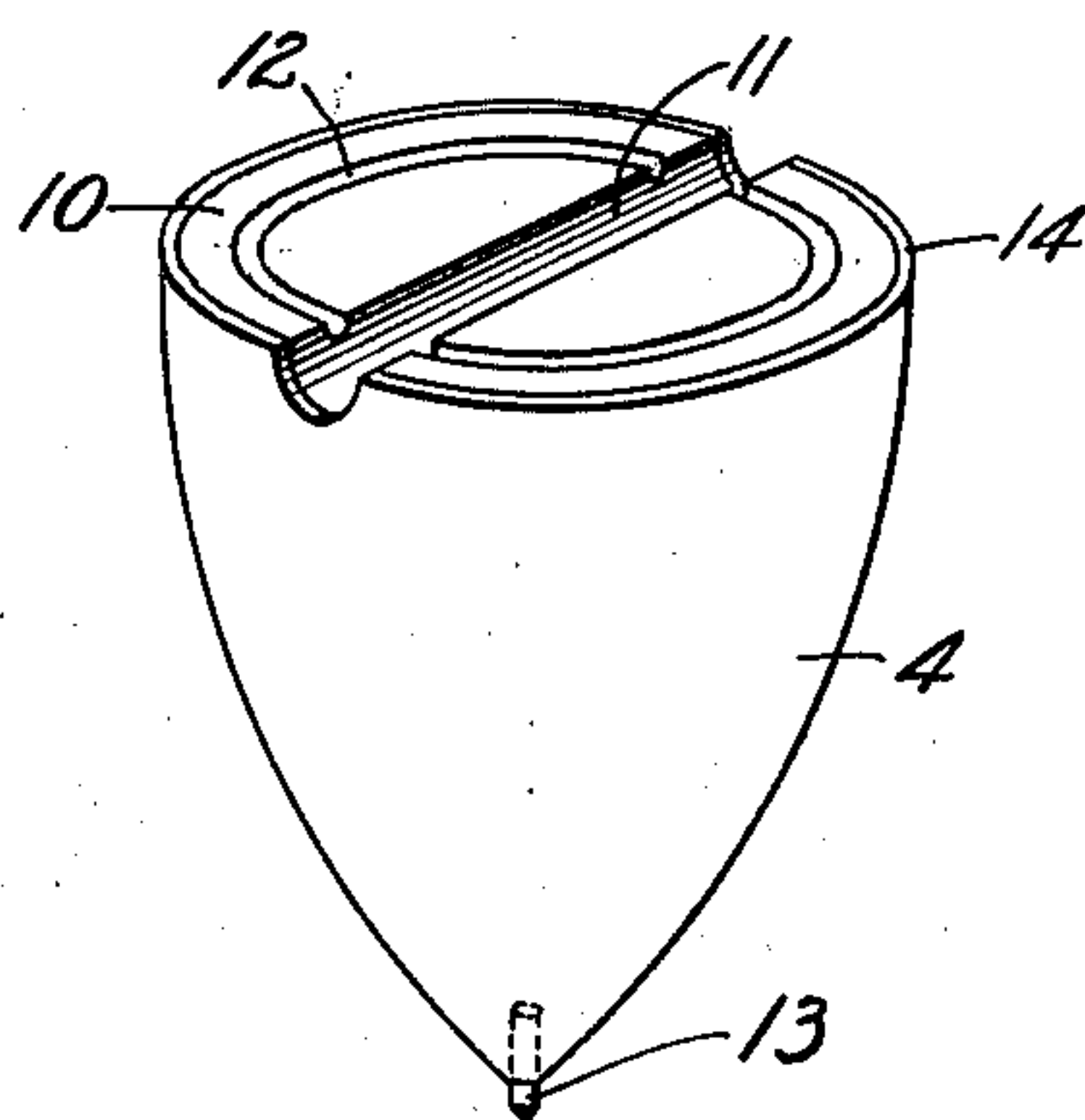


FIG. 2.



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PHONOGRAPH NEEDLE

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This invention relates to reproducers adapted to be used for playing back original soft wax records and more particularly to a needle suitable for such reproducers.

5 It is the object of this invention to provide a needle of this sort which is of sturdy construction, easy to make, and of the permanent type.

10 In addition to these features it is understood of course that a playback needle must be very light and very stiff to reproduce records faithfully and without injury to the soft wax. All of these requirements are met satisfactorily by a needle having a body portion of light weight wood fitted with a sap-
15 phire point and covered with a thin coating of duralumin paint. As the point is very durable the needle preferably is secured permanently to the diaphragm.

20 In the drawing, Fig. 1 shows the needle of this invention applied to one type of reproducer, and

Fig. 2 is a detail view of the needle.

These needles are particularly adapted for
25 use with reproducers of either the electromagnetic or the electrodynamic type in which they flex the diaphragm about one of its diameters. Fig. 1 discloses one form of electrodynamic or moving coil reproducer
30 with which these needles may be advantageously used. The diaphragm 1 is adapted to flex about the diameter normal to the plane of the drawing and is stiffened against flexure at right angles to this axis by groove
35 2. Groove 3 further stiffens the diaphragm against local flexure of the portion in contact with the needle 4. A suitable coil 5 carried by the diaphragm moves with it in an annular gap between pole pieces 7—7' and
40 another magnetic member 8. An exciting winding 9 produces a steady flux in the gap so that movements of the needle are translated into corresponding currents in the coil. For faithful reproduction the coil move-
45 ments must, of course, correspond exactly to the vibrations of the needle. To this end undesirable local vibration in the needle and in the diaphragm is prevented by making the needle base unusually large thereby
50 giving the needle very great inherent stiff-

ness and providing large area of contact with the diaphragm.

The construction of the needle 4 is clearly shown in Fig. 2 in which the main body portion 10 is shown as a cone of balsa wood with a non-linear taper. Grooves 11 and 12 in the
55 base of the cone correspond to grooves 2 and 3 in the diaphragm and insure that the needle will be properly located on the diaphragm when it is secured in place. The
60 sapphire point 13 is permanently cemented into the end of the cone and the coating of metal paint 14 is sprayed on the body portion to a thickness of about 10 mils (for a
65 needle 1 inch long).

Obviously the body portion need not be exactly as shown but may take any form which results in a needle of the proper weight and stiffness. It also will be understood that for best results the thickness of
70 the metal coating should be varied in accordance with the diameter and length of needle employed. The low mass and high stiffness features of this type of construction have
75 already been emphasized but it should be noted also that in spite of the low mass requirement these needles are very sturdy and comparatively easy to make.

What is claimed is:

1. A reproducer needle consisting of a
80 body portion of light weight wood coated with metal and fitted with a permanent needle point, the base diameter of the body portion being comparable to its length.

2. A reproducer needle consisting of a
85 conical body of balsa wood coated with duralumin and fitted with a sapphire point, the base diameter of the body being comparable to its length.

4. In an electrical pick-up device a moving
90 system including a wooden needle of large base diameter coated with metal and attached to a diaphragm.

4. In an electrical pick-up device a moving
95 system including a wooden needle of large base diameter attached to a diaphragm the needle being coated with metal and fitted with a permanent point.

5. In an electrical pick-up device a mov- 100

ing system including a balsa wood needle,
of large base diameter attached to a dia-
phragm the needle being coated with dur-
alumin paint and fitted with a sapphire
5 point.

In witness whereof, I hereunto subscribe
my name this 29th day of September, 1928.
LOUIS A. MORRISON.

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