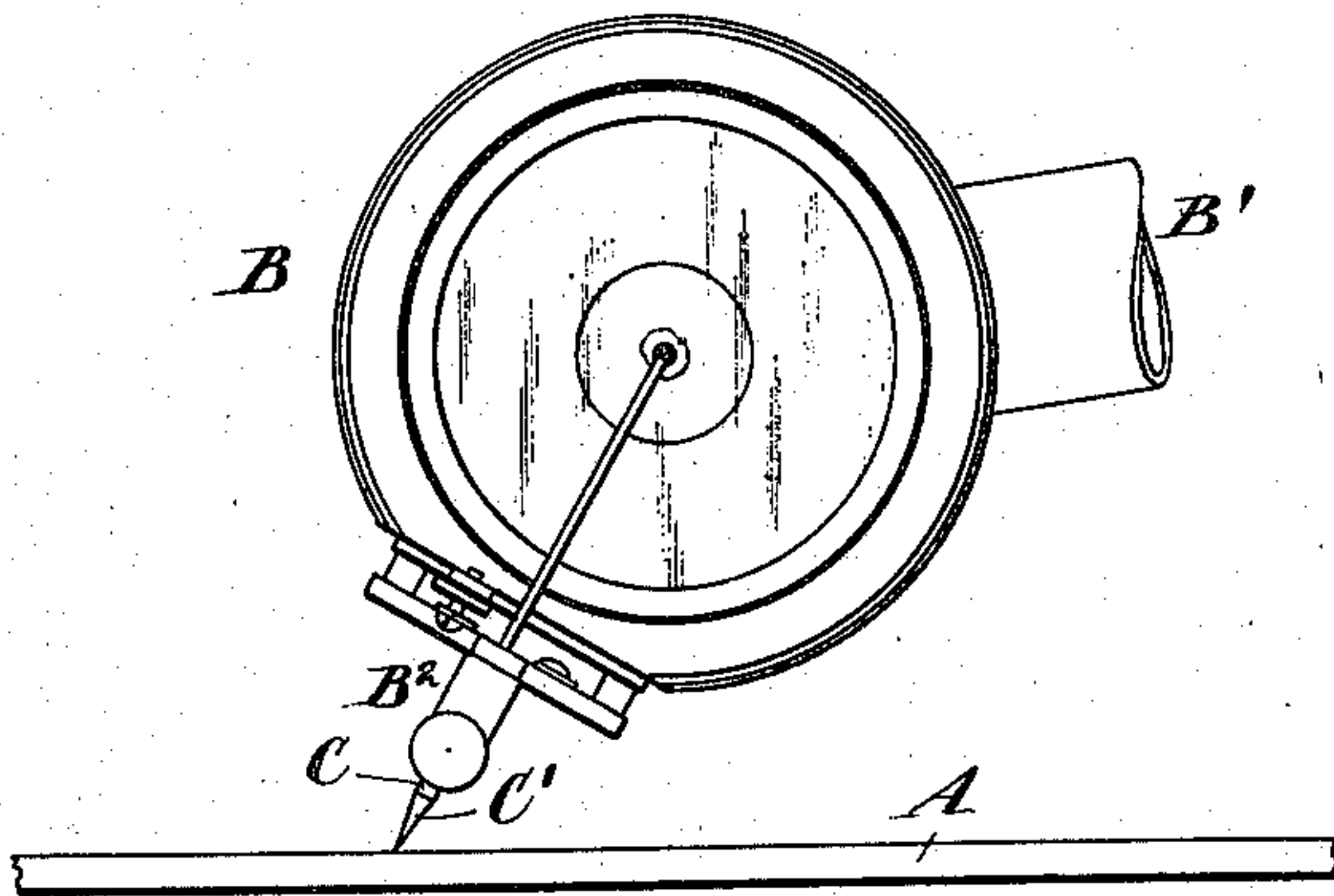


No. 866,950.

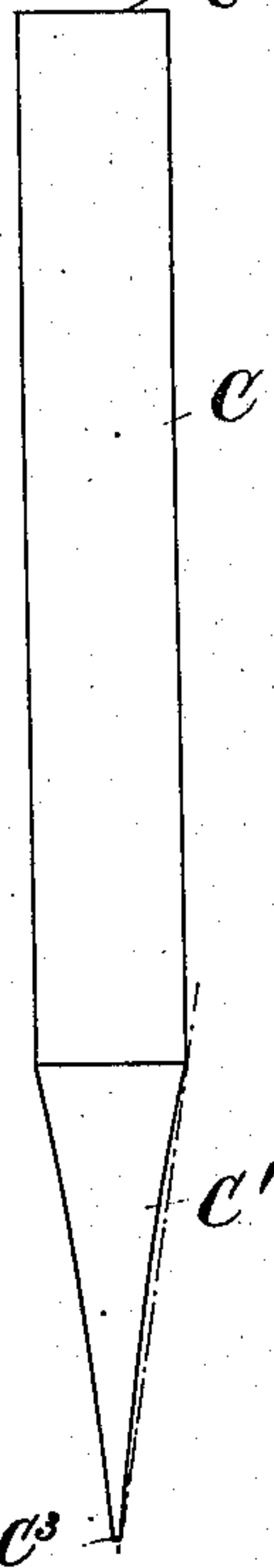
PATENTED SEPT. 24, 1907.

C. L. MEYERS.  
NEEDLE FOR TALKING MACHINES.  
APPLICATION FILED JULY 19, 1907.

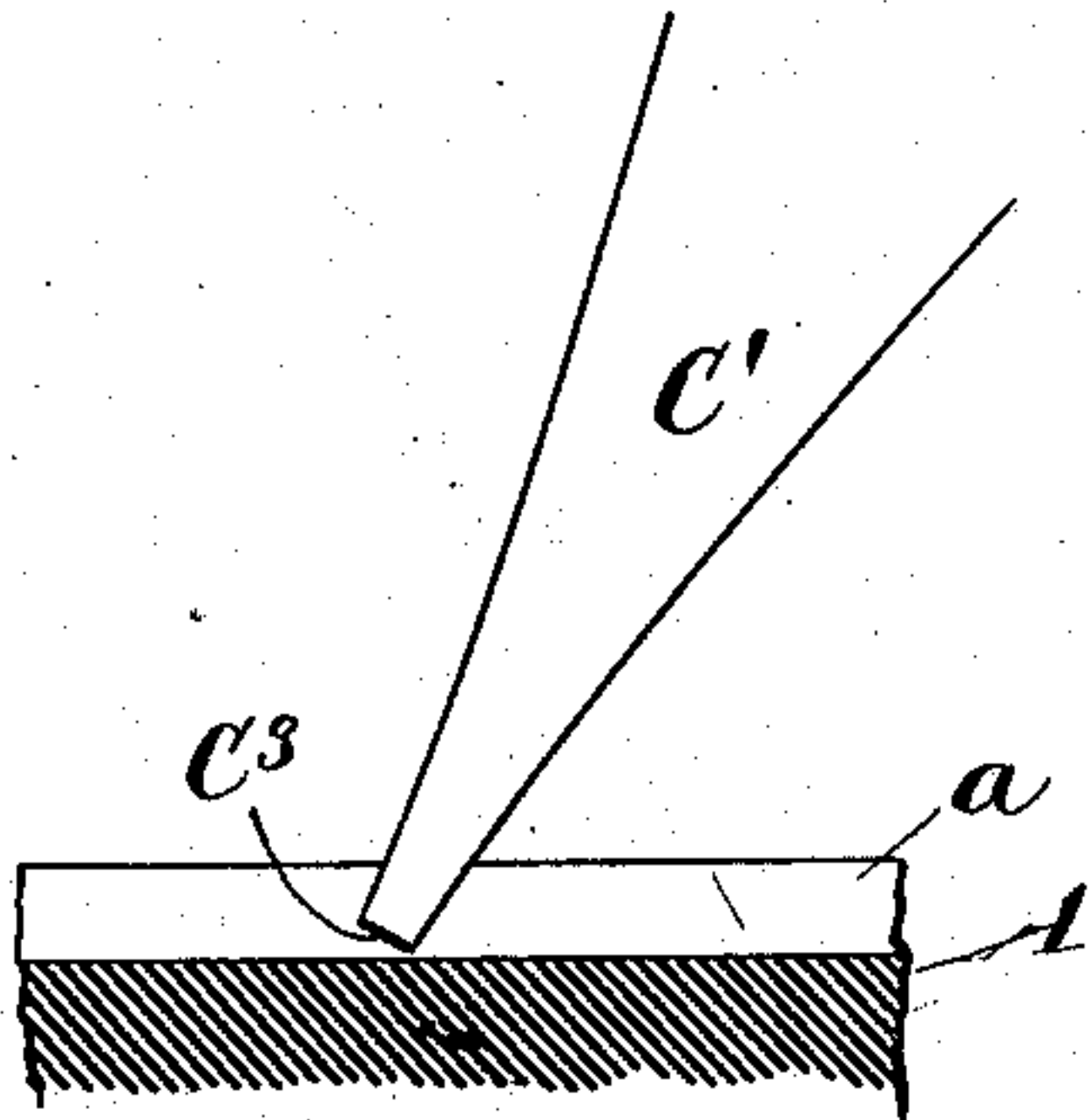
*Fig. 1.*



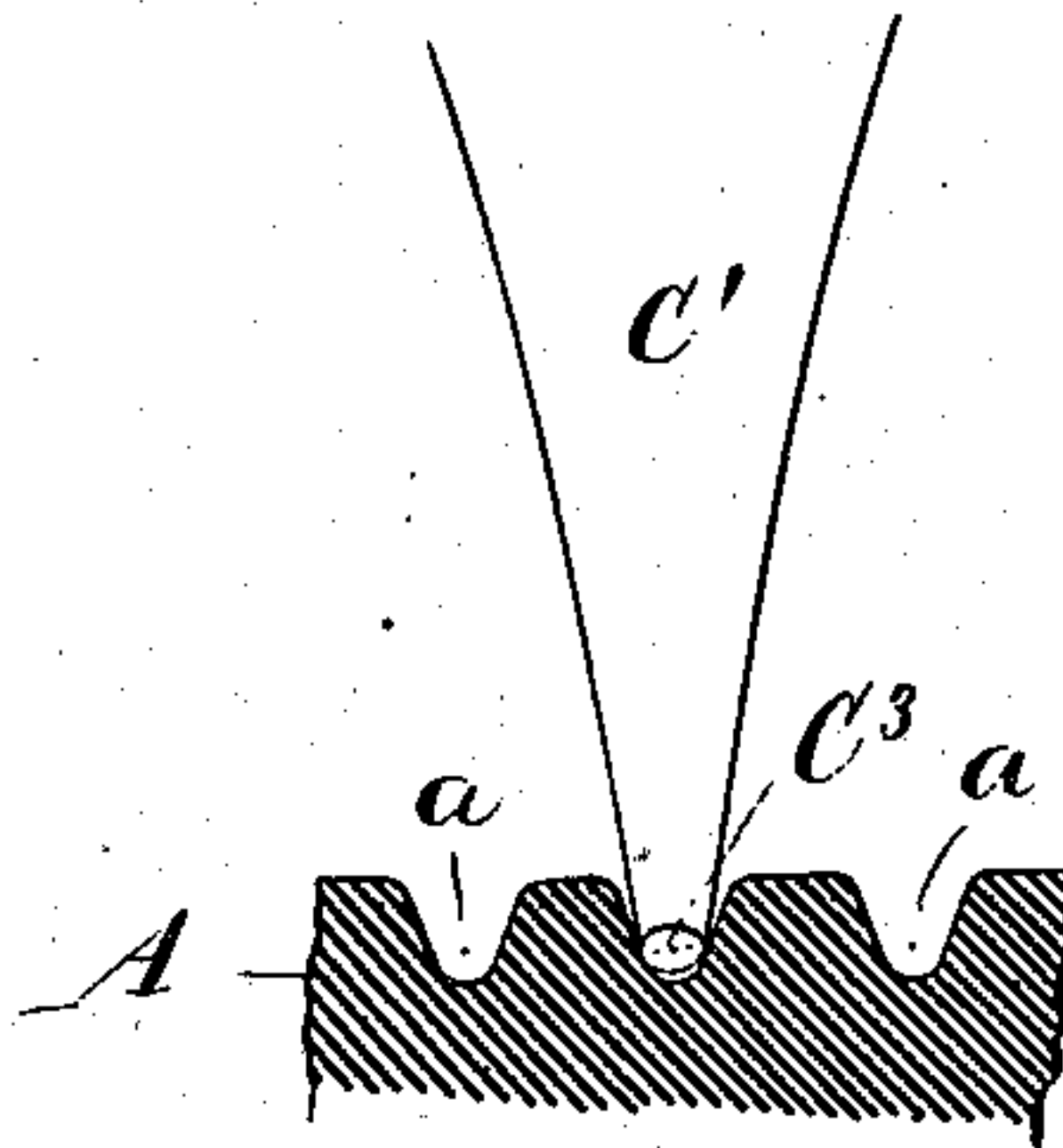
*Fig. 2.*



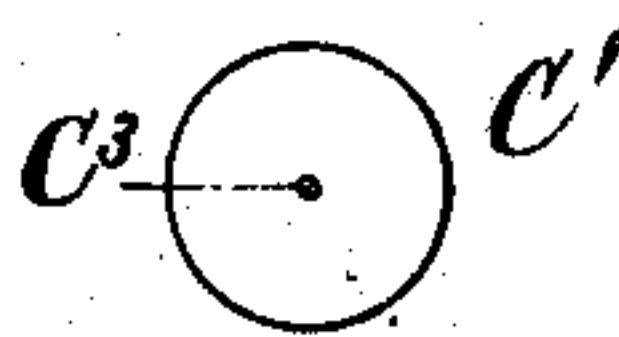
*Fig. 4.*



*Fig. 5.*



*Fig. 3.*



Witnesses:  
L. M. Lewis  
H. J. Peterson

Inventor:  
Charles L. Meyers,  
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Charles R. Searle



# UNITED STATES PATENT OFFICE.

CHARLES L. MEYERS, OF JERSEY CITY, NEW JERSEY.

## NEEDLE FOR TALKING-MACHINES.

No. 866,950.

Specification of Letters Patent.

Patented Sept. 24, 1907.

Application filed July 19, 1907., Serial No. 384,535.

To all whom it may concern:

Be it known that I, CHARLES L. MEYERS, a citizen of the United States, residing in Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Needles for Talking-Machines, of which the following is a specification.

The invention relates to needles used in instruments of the talking machine class for engaging the groove in the record and transmitting sound vibrations induced thereby to the diaphragm of the reproducer, and the object of the invention is to provide a needle which in coöperation with the record groove and sound-box, will reproduce the record clearly and distinctly, with marked lessening of "scratch" and increased fidelity to true tonal qualities.

The invention consists in certain details of form, size, and proportions of parts, by which the above objects are attained, to be hereinafter described.

The accompanying drawings form a part of this specification and show what is considered to be the best form of the invention.

Figure 1 is an elevation of a portion of a record and sound-box showing the improved needle in place. Fig. 2 is an elevation or side view of the needle alone, on a greatly magnified scale. Fig. 3 is a corresponding end view. Fig. 4 is a section through a portion of a record, on a still larger scale, showing the point of the needle in elevation, in a record groove. The line of section being the center line of such groove. Fig. 5 is a corresponding section and elevation. The line of section being transverse to the grooves.

Similar letters of reference indicate the same parts in all the figures.

By careful research and experiment I have demonstrated that certain sizes, proportions, and forms, together with material of the proper character, are necessary in the construction of a needle capable of producing the desired effects in service. The present invention is the result of such investigation and is based on the discoveries thus made.

A is a record which may be understood to be a standard disk record made by the Victor Talking Machine Company, and having the usual volute groove *a* therein, and B a standard sound-box having a tube *B*<sup>1</sup> leading therefrom to a horn, not shown, and a socket *B*<sup>2</sup> for a needle.

The improved needle has a cylindrical body *C* and a concavely tapered point *C*<sup>1</sup>; the upper end of the body and the lower extremity of the point terminate in plane faces, marked *C*<sup>2</sup>, *C*<sup>3</sup> respectively, parallel with each other and at a right angle to the axial line of the needle.

My experiments indicate that the body *C* of the needle should be sixtyfive one-thousandths (65/1000) of an inch in diameter; the diameter of the point-face

*C*<sup>3</sup>, two one-thousandths (2/1000) of an inch; the maximum concavity of the curve forming the tapered point should be four one-thousandths (4/1000) of an inch; the length of the point two hundred and thirty-five one-thousandths (235/1000) of an inch; the length of the cylindrical body four hundred and fifty one-thousandths (450/1000) of an inch, and the total length six hundred and eightyfive one-thousandths (685/1000).

I have found the best material to be highly carbonized steel of tough fiber, hardened to as great a degree as may be without becoming brittle.

It is believed the reason for the increased efficiency of the improved needle is largely due to the form of the point and the position it occupies in the groove. Its concavity insures contact on the sides of the groove at two points only, and the flat face at the termination of the point lies always above and out of contact with the bottom of the groove, thus the area of contact is extremely limited resulting in greatly lessening the objectionable "scratch" ordinarily very noticeable. The form of the point permits it to penetrate to sufficient depth in the groove to insure perfect engagement therewith, and the attenuation of the point permits the latter to follow accurately slight sinuosities in the lateral bends or convolutions of the groove, by which the sound vibrations are reproduced, thus avoiding "slurring". The flat upper face *C*<sup>2</sup> tends to increase the area of contact with the socket *B*<sup>2</sup> in which the needle is held, and aids thereby in transmitting the vibrations.

Whether the above theoretical reasoning be correct or not, the fact remains that a needle formed as shown and described produces results far in advance of those produced by any other needle known to me. The improvement is especially marked in the reproduction of instrumental music and the tones of the singing or speaking voice. The clearness of detail, accentuation and the tone qualities of the human voice are distinguishable to the faintest inflection and intonation. In band music the broad tones of the bass horns are reproduced with softness and true tonal value, preserving all the effect of their great sound volumes. On the middle register and high notes there is a clearness of tone and distinctness of sound identical with actual playing.

The improved needle by reason of its form and peculiar engagement with the groove, wears but little and apparently reproduces the last notes of the record as clearly and distinctly as the first, and also acts less destructively on the record, thus prolonging its term of usefulness.

I claim:—

1. The talking machine needle described, comprising a body and a concavely tapered point.



2. The talking machine needle described, comprising a cylindrical body and a concavely tapered point.
3. The talking machine needle described, comprising a body, a concavely tapered point, and a plane face forming the termination of said point.
4. The talking machine needle described, comprising a cylindrical body, a concavely tapered point, a plane face at the end of said body, and a plane face forming the termination of said point, said faces arranged parallel to each other and at a right angle to the axial line of said needle.
5. In a talking machine needle, a cylindrical body having a diameter of  $65/1000$  of an inch, a concavely tapered point  $235/1000$  of an inch in length and terminating in a plane face  $2/1000$  of an inch in diameter and arranged at a right angle to the axial line of said needle, the concavity of said point being  $4/1000$  of an inch at the greatest depth of the curve.
6. The talking machine needle described, comprising a cylindrical body, a concavely tapered point, and a plane face forming the termination of the latter, in combination with a sound-box and record of a talking machine.
- In testimony that I claim the invention above set forth I affix my signature, in presence of two witnesses.
- CHARLES L. MEYERS.
- Witnesses:  
LEWIS R. MEYERS,  
CHARLES R. SEARLE.