





# UNITED STATES PATENT OFFICE.

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## TALKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 613,670, dated November 8, 1898.

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*To all whom it may concern:*

Be it known that I, LEON F. DOUGLASS, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Talking-Machines, of which the following is a specification.

My invention relates to improvements in talking-machines, or machines commonly called "phonographs" or "graphophones."

The chief or principal defect in or objection to ordinary talking-machines heretofore in use is that the volume of the sound produced is comparatively small, resulting in a weak and more or less indistinct effect quite different from that of the natural voice or original music, instrumental or vocal, and the devices heretofore employed for amplifying the sounds reproduced by talking-machines, while making it louder, still further accentuate the difference between the sounds reproduced and the natural ones of the voice or of the musical instruments whose sounds have been recorded.

The object of my invention is to provide a machine of a simple and efficient construction by means of which sound-records may be reproduced with great clearness, volume, force, effect, and naturalness and so as to substantially reproduce the effect of the original when first spoken or played.

I have discovered that by combining with the rotating sound-record two or more reproducers, with the reproducing-points of the one following or tracking after the other in the same sound-record groove or thread, the important objects or results above mentioned may be accomplished.

In practicing my invention I mount two or more reproducers on the same feed slide or carriage in such position as that the reproducing-point of the one will be in the same vertical plane with the other and only a short distance behind, so that there will be only a comparatively short length of the sound-record groove between the two reproducing-points. Although I have found by my experiments that the reproducing-points, following one after the other in the same sound-record groove, may be at a considerable

distance from each other—as, for example, a quarter, a third, or more of the circumference of the ordinary sound-record cylinder—without occasioning any appreciable variation in time of the sounds reproduced by each of the reproducers, the length of the sound-record of an ordinary sound-record cylinder for a single word extends frequently two or more times around the ordinary sound-record cylinder, and it will therefore be seen that in practicing my invention the reproducing point or stylus of the one reproducer may be separated a considerable distance from the other and still cause the two reproducers to act harmoniously and to both act with substantial simultaneousness or so nearly simultaneous that the difference cannot be distinguished by the ear.

Embodying this principle and mode of operation my invention consists in the combination, with a rotating sound-record, of two or more reproducers having their reproducing-points arranged one after another and traveling in the same sound-record groove.

In the accompanying drawings, forming a part of this specification, and in which similar letters indicate like parts in both figures—

Figure 1 is a partial plan view of a talking-machine embodying my invention, and Fig. 2 is a vertical section on line 2 2 of Fig. 1.

In the drawings, A represents the frame of the machine; B, the revolving mandrel for receiving or holding the revolving sound-record C, the same being preferably of a cylindrical form, and D D' are the two reproducers, the same being each of any ordinary or suitable construction and each having a stylus or reproducing-point *d*, the one directly behind the other and separated by a short distance or space.

F is the slide or carriage, upon which the reproducers are mounted the one above the other. The lower reproducer D is mounted on the usual tubular arm F' of the slide or carriage F, and the upper reproducer D' is mounted on a similar arm F<sup>2</sup>, which is carried by an arm or bracket F<sup>3</sup>, with which the reproducer slide or carriage F is provided for this purpose. The slide or carriage F is also provided with tubular arms F<sup>4</sup> F<sup>5</sup> for receiving



ing the customary horns or other sound-conveying devices.

G is the feed-screw, by which the slide or carriage F is moved back and forth, and H represents the gearing connecting the feed-screw with the mandrel, and H' the driving-pulley.

My invention may be applied to any ordinary graphophone or phonograph now in use by simply adding thereto the extra reproducer D' and connecting to the feed slide or carriage F in any suitable manner an upright bracket or arm F<sup>3</sup>, upon which the second reproducer is mounted, so that the same feed-slide will feed or convey both reproducers simultaneously. Each of the reproducers may be of any suitable construction known to those skilled in the art.

In the drawings I have illustrated the familiar form of reproducers now commonly used upon graphophones, the same consisting, essentially, of the stylus *d*, stylus-lever *d'*, diaphragm *d*<sup>2</sup>, and connection *d*<sup>3</sup>, and a hollow shell or frame-piece upon which the parts are mounted.

I claim—

1. In a talking-machine, the combination with a rotating sound-record of two or more

reproducers, the stylus or reproducing-point of the one following that of the other in the same sound-record groove, substantially as specified.

2. In a talking-machine, the combination with a rotating sound-record of two reproducers arranged one above and after the other, and operating to reproduce simultaneously, substantially as specified.

3. In a talking-machine, the combination with a rotating sound-record of two reproducers arranged one above and after the other, and operating to reproduce simultaneously, and a feed slide or carriage provided with an arm or bracket to receive the upper-reproducer-carrying tubular arm, substantially as specified.

4. The combination with a feed slide or carriage having an arm F<sup>3</sup>, tubular arms F<sup>4</sup>, F<sup>5</sup>, and tubular reproducer-receiving arms F' F<sup>2</sup>, and reproducers D D' mounted on said tubular arms F' F<sup>2</sup>, one after another, and a sound-record mandrel and feed-screw.

LEON F. DOUGLASS.

Witnesses:

EDMUND ADCOCK,

MUNDAY, EVARTS & ADCOCK.