

**No. 630,869.**

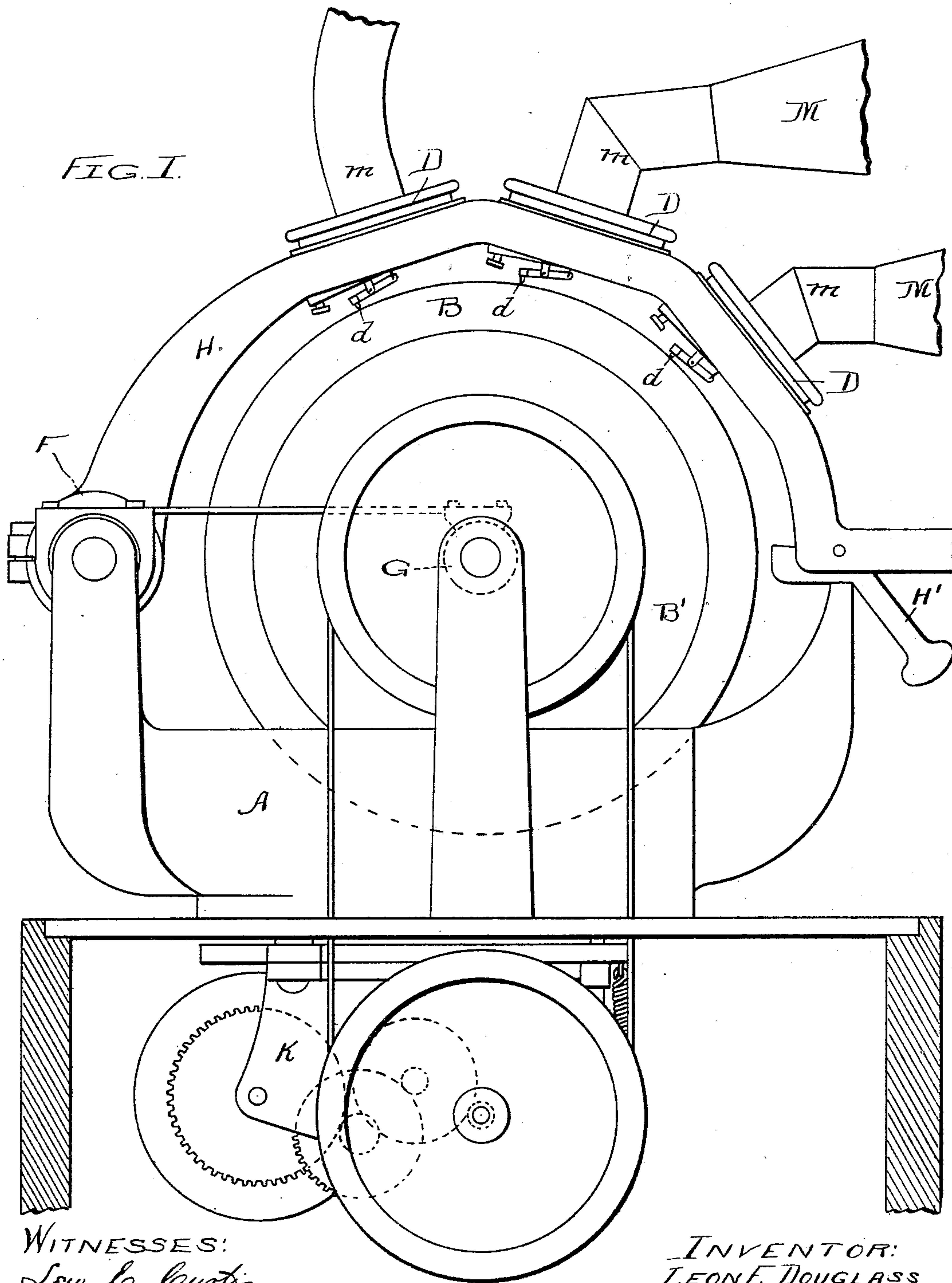
**Patented Aug. 15, 1899.**

**L. F. DOUGLASS.  
TALKING MACHINE.**

(Application filed May 11, 1899.)

2 Sheets—Sheet 1

(No Model.)



WITNESSES:

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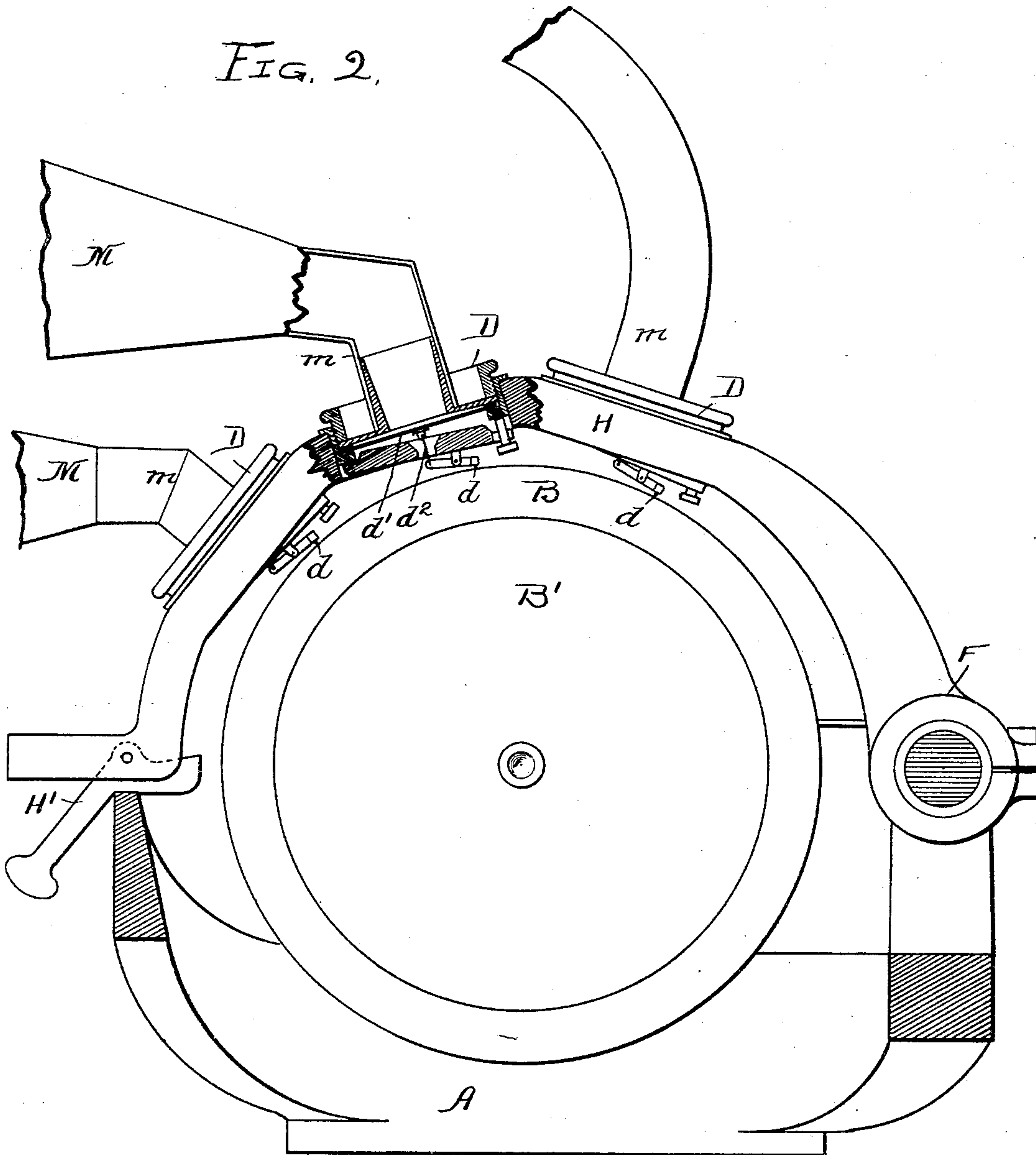
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2 Sheets—Sheet 2.

FIG. 2.



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# UNITED STATES PATENT OFFICE.

LEON F. DOUGLASS, OF CHICAGO, ILLINOIS, ASSIGNOR TO CHARLES  
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## TALKING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,869, dated August 15, 1899.

Application filed May 11, 1899. Serial No. 716,341. (No model.)

*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.

10 In talking-machines, phonographs, or graphophones heretofore generally in use wherein the sound is recorded upon and reproduced from a blank or cylinder of wax-like composition of about two inches in diameter rotating at a speed of about one hundred or one  
15 hundred and twenty revolutions per minute the speech, vocal music, instrumental music, or other sounds recorded and reproduced have been faint and defective and lacking in volume, loudness, clearness, distinctness, and  
20 naturalness, being generally accompanied with a harsh and disagreeable frying noise, and many attempts have heretofore been made to remedy such defects. One material  
25 improvement made and patented to me in Letters Patent of the United States No. 613,670, of November 8, 1898, and which is now commonly known as the "polyphone," consists in combining with the rotating sound-record  
30 blank or cylinder two or more reproducers, with reproducing-points or styli tracking one after another in the same sound-record groove, the interval or space between them being so short that both reproducers reproduce the  
35 same sounds substantially simultaneously, thus doubling or multiplying the volume, clearness, and perfection of the reproduction. Another improvement, operating on a different principle, which I have made and upon  
40 which I have filed application for patent in the United States consists, essentially, in combining with a single reproducer a sound-record cylinder or blank of two or three times the diameter heretofore generally used and  
45 rotating at substantially the same high speed of one hundred or one hundred and twenty revolutions per minute previously employed for the small or two-inch sound-record cylinder, thus doubling or trebling the surface  
50 speed at which the sound-record groove en-

gages the reproducing-point or stylus, and so increasing the force or intensity of the blows exerted upon the diaphragm of the reproducer as to render the sounds reproduced many times louder and clearer, indeed to a  
55 surprising extent and so that they can be distinctly heard at a considerable distance. I have discovered that by constructing a single unitary machine or apparatus combining these two principles or modes of operation, so that they mutually cooperate and each complements and reinforces the other, speech, vocal music, instrumental music, and other sounds may be reproduced in a very surprising manner and very greatly superior in  
60 point of volume, loudness, clearness, distinctness, and naturalness to the results produced either by my polyphone or my large cylinder machine and that the reproduction can by this new means be distinctly heard at a distance of several hundred feet.

My invention consists in the means I employ to accomplish this new and useful result—that is to say, it consists in the combination, with a sound-record cylinder of large diameter, preferably of about or substantially  
75 six inches diameter, rotating at high speed, preferably about one hundred or one hundred and twenty revolutions per minute, of a multiplicity of reproducers arranged tandem or one after another with their styli following or tracking in the same sound-record groove and operating to reproduce simultaneously, or substantially so, the same sounds, whereby the volume, loudness, clearness, and  
80 distinctness of the reproduction is very greatly increased. By reason of the large size or diameter of the sound-record cylinder I am enabled to arrange three or more reproducers in cooperative position about the upper half of the sound-record cylinder, while the greatly-increased surface speed of the cylinder causes the several styli of the sound-reproducers to be operated by the same portion of the sound-record at such very short  
85 intervals of time between as to be wholly inappreciable to the ear, thus giving the effect of a single stylus or reproducer in respect to simultaneousness, while securing the effect of the several reproducers in respect to vol- 100



ume, &c., and at the same time also accomplishing the result due to the large size of the cylinder and its rapid speed upon each reproducer.

5 In the accompanying drawings, forming a part of this specification and in which similar letters of reference indicate like parts in both views, Figure 1 is an end elevation of a talking machine or apparatus embodying my invention, and Fig. 2 is a vertical section.

10 In said drawings, A represents the frame of the machine. B is the sound-record cylinder of a wax-like composition, the same as those heretofore in use on graphophones or phonographs, excepting that it is of a large size of from two to three times the diameter of those heretofore commonly in use—that is to say, it is from four to six inches in diameter.

20 D D D are a series of reproducers arranged tandem or one after another, so that their reproducing-points or styli *dd* follow or track one after another in the same sound-record groove and are separated from each other by only a short distance or space.

25 F is the feed slide or carriage, upon which the several reproducers D D D are mounted and by which they are all fed or moved together simultaneously from one end of the sound-record cylinder to the other by the feed-screw G, said feed-slide having a curved hinged arm H by which the reproducers D D D may be raised or lifted out of contact with the sound-record cylinder B by the lifting-lever H'.

35 K is a spring or other motor by which the sound-record cylinder B or its shaft or mandrel B' is rotated at a uniform high speed of about one hundred or one hundred and twenty revolutions per minute.

40 M M M are horns or sound-conveying devices connecting with the several reproducers. Their inner ends *m m m* are preferably curved or bent, so that the horns may all have the same general direction notwithstanding the curvature of the arm H upon which the reproducers are carried.

The reproducers D may be of any suitable construction familiar to those skilled in the art. Each, however, preferably comprises a reproducing-point or stylus *d* and diaphragm *d'*, with suitable connections *d<sup>2</sup>* between the stylus and diaphragm.

I claim—

1. The combination with a large sound-record cylinder of wax-like composition of sub-

stantially from four to six inches diameter, of a motor for rotating said sound-record cylinder at a high speed of substantially one hundred to one hundred and twenty revolutions per minute, and two or more reproducers arranged tandem or one after another, the stylus or reproducing-point of one following another in the same sound-record groove, substantially as specified.

2. The combination with a large sound-record cylinder of wax-like composition of substantially from four to six inches diameter, of a motor for rotating said sound-record cylinder at a high speed of substantially one hundred to one hundred and twenty revolutions per minute, and two or more reproducers arranged tandem or one after another, the stylus or reproducing-point of one following another in the same sound-record groove, and a feed slide or carriage having a curved hinged arm encircling the upper half of the sound-record cylinder upon which said reproducers are mounted, substantially as specified.

3. The combination with a series of reproducers arranged tandem or one after another, of a sound-record cylinder of large diameter rotating at high speed sufficient in connection with the large diameter of the sound-record cylinder to cause the sound-record groove to engage the stylus of each reproducer at such high speed, substantially one hundred and fifty feet per minute as to individually reproduce the sound recorded upon the record with great volume, clearness and distinctness, and to engage the series of styli of the series of reproducers at such short intervals of time as to produce the effect upon the ear of substantially simultaneousness, substantially as specified.

4. The combination with a series of reproducers arranged tandem or one after another, of a sound-record cylinder engaging the reproducing-points or styli of said reproducers at a surface speed of substantially from one hundred to one hundred and fifty feet per minute, whereby the sounds are reproduced with great volume, loudness, clearness of quality and distinctness, and with substantial simultaneousness in respect to the operation of all the reproducers, substantially as specified.

LEON F. DOUGLASS.

Witnesses:

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