No. 663,194. Patented Dec. 4, 1900.

F. MYERS.

PHONOGRAPH.

(Application filed Oct. 12, 1900.)

(No Model.) 3 Sheets—Sheet 1.

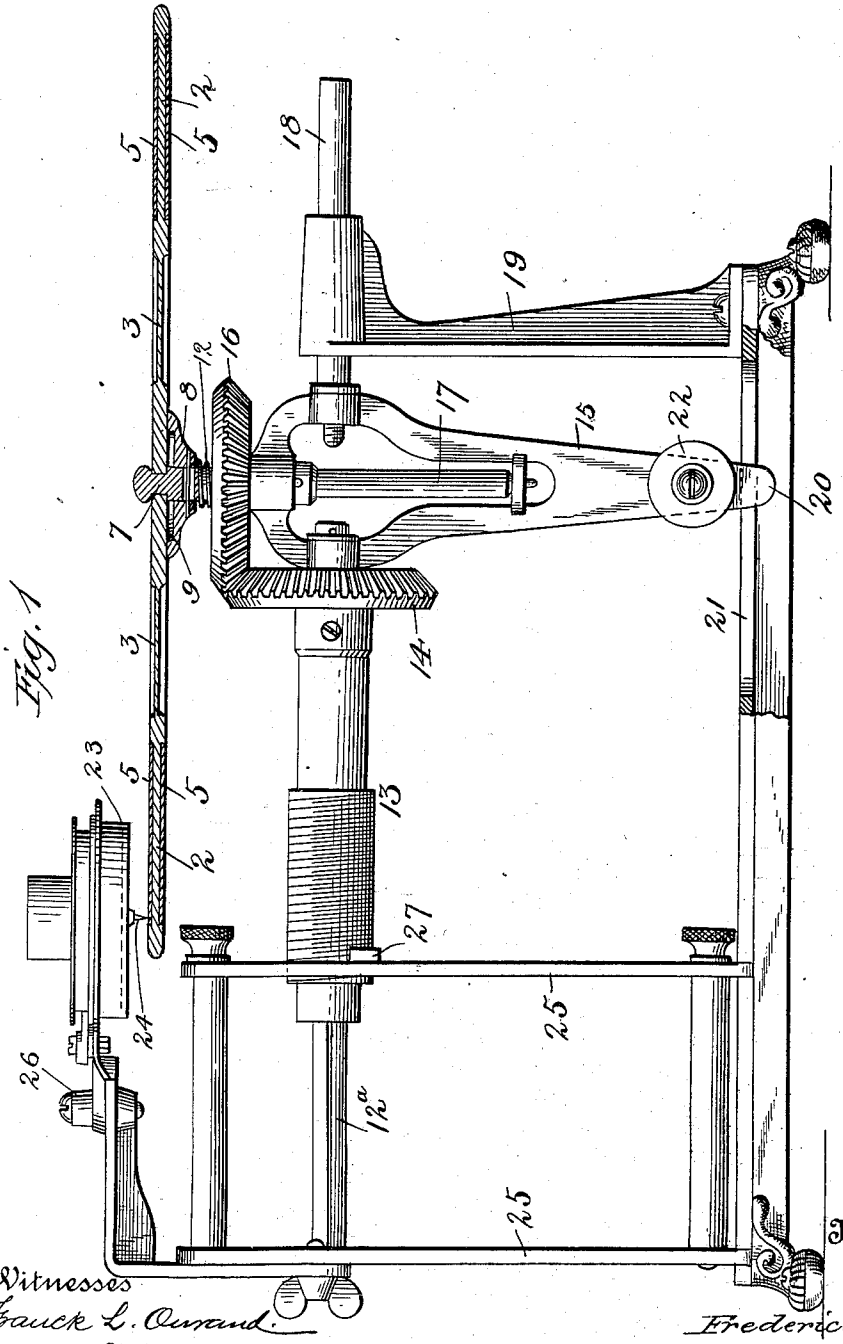

Fig. 1.

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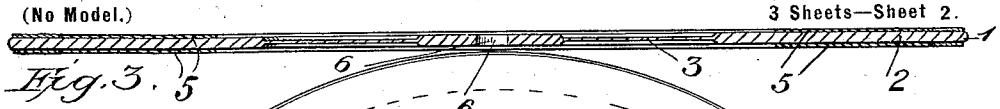

Fig. 3.

Fig. 2.

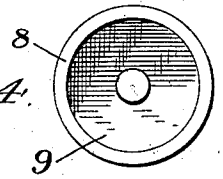

Fig. 4.

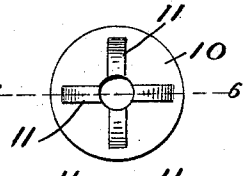

Fig. 5.

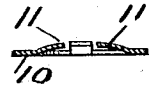

Fig. 6.

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(No Model.) 3 Sheets—Sheet 3.

Fig. 7.

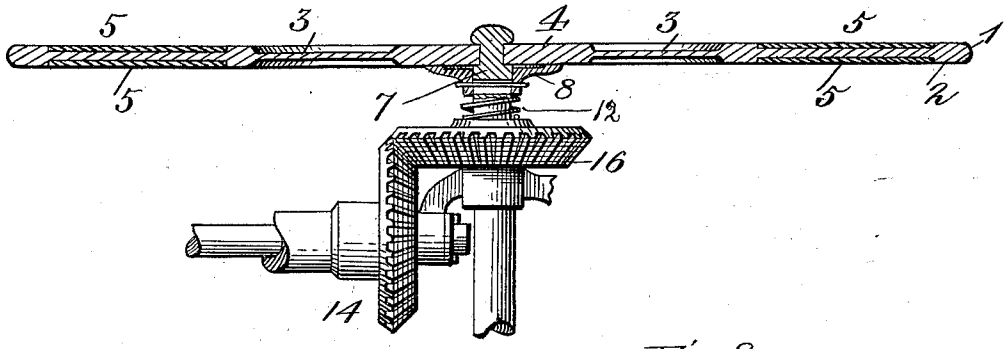
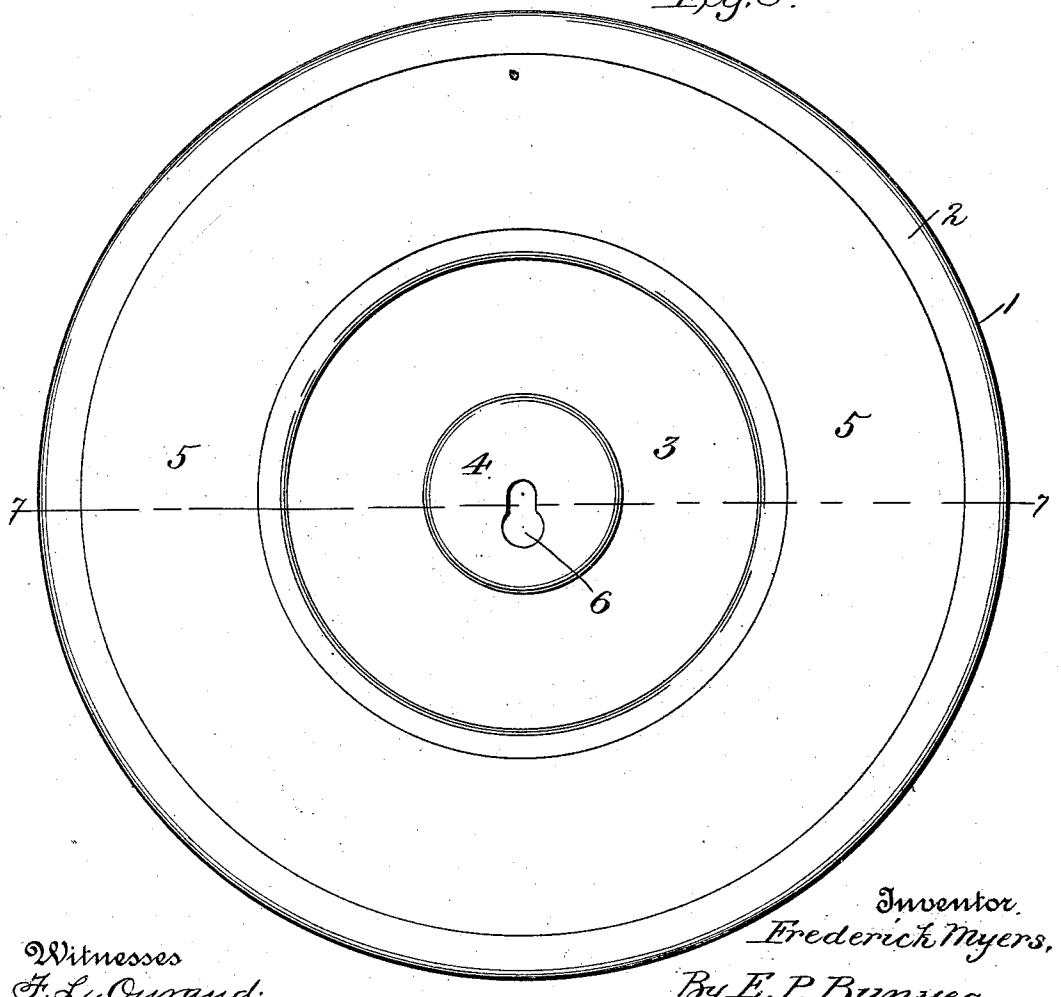


Fig. 8.



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UNITED STATES PATENT OFFICE.

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SPECIFICATION forming part of Letters Patent No. 663,194, dated December 4, 1900.

Application filed October 12, 1900. Serial No. 32,869. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK MYERS, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented certain new and useful Improvements in Phonographs; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

This invention relates to phonographs, and particularly to record-disks to be used on sound-reproducing instruments of different kinds. In the machines of this character which use the disk records it has been the customary practice to mount a rigid inflexible disk upon a rigid central support and to provide some means for revolving the support and record and at the same time move the record laterally, the style being permitted to follow the grooves of the record by gravity or by spring action. It has been found in practice that many defects exist in machines of this character owing to the fact that both the style and the record are constructed to move in unison, each depending upon the other for a portion of the action required. By a long series of experiments it has been discovered that if all the movements necessary are given to the record-disk a much more perfect reproduction is attained, since there is no interdependence of one part upon another. Moreover, by giving all the necessary movements to one part—the record—a much more simple and less complicated arrangement of mechanism may be employed. To overcome the existing defects in this class of machines, it has been proposed to mount a rigid record-disk upon a yielding support in order that the disk may be held in contact with a style, the record having the necessary revolution and lateral movements imparted to it to make the style follow the grooves in the record; but this I do not claim as my present invention. By further experiments I have ascertained that this construction may be greatly improved and simplified by using a record-disk having an elastic or yielding central portion. With such a record a stationary style may be used, and if the record-disk is rotated and fed laterally the style will follow the grooves in the record-disk in a regular and perfect manner owing to the fact that the record is always held in contact with the style by its inherent flexibility or yielding central portion. The best results have been attained by the use of a celluloid record-disk having a comparatively thin flexible central portion and a rim of greater thickness having the record embossed therein. Other materials, like vulcanite, indurated fiber, or parchment, produce good results; but celluloid is preferred for many reasons and may be molded of the required form and thickness in different parts at a comparatively slight cost.

In its broadest aspect my present invention contemplates a record-disk made of any suitable material having a flexible or yielding portion which serves to hold the record up to a style by its inherent resiliency. This invention also includes the necessary parts of the instrument upon which such a record-disk may be made available.

In the accompanying drawings, which form a part of this specification, Figure 1 is a side elevation of so much of a sound-reproducing instrument as is deemed necessary to illustrate my present invention and showing the record-disk and its central supporting-pin in section and a portion of the base of the instrument broken away to better illustrate certain parts. Fig. 2 is a plan view of a record-disk made in accordance with my invention. Fig. 3 is a transverse section on the line 3 3, Fig. 2. Fig. 4 is a plan view of a support for the record-disk. Fig. 5 is a plan view of a spring-plate which may be used for holding the record in place on the central pin and on the support shown in Fig. 4. Fig. 6 is a transverse section on line 6 6, Fig. 5. Fig. 7 is a detail elevation of the miter-gears for rotating the record and showing in section a modified form of record-disk, taken on line 7 7, Fig. 8, the central pin, and a modified form of support for the record. Fig. 8 is a plan view of the record-disk shown in Fig. 7.

Like numerals of reference designate like parts wherever they occur in the different views of the drawings.

Referring to Figs. 1, 2, and 3 of the drawings, the numeral 1 designates a record or tablet, which is by preference made of celluloid and may be provided with a thickened outer portion 2, a thin flexible or yielding portion 3, and a central hub 4. The record 5 may be formed directly in the tablet and may be embossed or cut upon both sides of said tablet, if desired, or the record may be formed in a thin ring of papier-mâché or other material and secured to the celluloid tablet. As shown in Figs. 7 and 8, the records 5 are secured in recesses formed in the tablet, thus giving practically a flush surface at the top and bottom of the tablet at the outer portion thereof. A keyhole-slot 6 is formed in the central hub 4 to accommodate the central pin 7. When the tablet is placed upon the pin 7 and moved until the head of said pin is over the smaller portion of the keyhole-slot 6, it will be held in place to rotate with said pin by any suitable means. In Figs. 1, 4, 5, and 6 is illustrated a support 8, secured to the central pin 7, said support 8 serving as a firm seat for the tablet and having an area of some extent as a bearing-surface for said tablet. The upper face of the support 8 is recessed, as at 9, and in this recess is a plate 10, having spring-fingers 11 cut therefrom. The function of these spring-fingers is to hold the tablet firmly in place between the head of the pin 7 and the upper portion of the support 8. The same effect may be produced in other ways—as, for instance, by mounting the support 8 so that it may have a limited vertical play upon the pin 7 and backing it up by a short spiral spring 12, as shown in Fig. 7. It will be understood that the tablet 1 is to be firmly secured to the central pin 7 and that the necessary resiliency is given to the tablet solely by the thin flexible portion 3 thereof.

In Fig. 1 I have shown a portion of an instrument with which may be used such a record as has been described. In said figure the numeral 12 designates the feed-screw shaft, and 13 a tubular feed-screw mounted to slide on said shaft and to rotate therewith. Secured to one end of the feed-screw is a miter-gear 14. One end of the shaft 12^a is journaled in a sliding bracket 15. The miter-gear 16 is secured to a vertical shaft 17, journaled in the sliding bracket 15, the shaft 17 having its upper end formed as a central pin 7 to support the tablet or record-disk. A stub-shaft 18 is secured at one of its ends to the sliding bracket 15, and said stub-shaft is journaled to revolve and slide in a rigid bracket 19, rising from the base of the instrument. The sliding bracket 15 has a toe 20 at its lower end, which may move laterally in a slot 21, formed in the base of the instrument, and a roller 22, secured to said sliding bracket, bears upon said base at the side of slot 21 to reduce friction, sustain the weight, and keep the parts in position. The sound-box 23 may consist of a plain casing having a diaphragm secured therein, and the style 24 may be secured directly to the diaphragm. The sound-box may be supported upon an arm adjustably secured to the motor-frame 25, and, if desired, the arm may be jointed or pivoted, as at 26, to permit the sound-box to be swung aside when it is desired to put on a new record. The feed-nut 27, which may be of ordinary construction, is attached to an arm in the usual manner, so that it may be thrown into and out of contact with the feed-screw 13 to move the record laterally or to stop the feed. Any suitable motor may be used, and it may be mounted in the frame 25.

The operation of the machine is as follows: The record-disk is secured to the central pin 7, as previously described, and when the feed-shaft 12 is revolved by the motor and the nut 27 is thrown into contact with the feed-screw 13 the record is revolved by the miter-gears 14 and 16 and moved laterally to the left in Fig. 1 by the feed screw and nut. The style 24 is held in contact with the record-grooves by means of the flexible portion 3 of the tablet. A record-tablet made as described is very sensitive to the action of the style and is held up to the style with just the required force to give the best results. It will be noted that while the portion 3 of the tablet 1 is resilient, flexible, or yielding the portion upon which the record is formed or secured is practically non-yielding or rigid. It will also be noted that a record may be formed on or secured to both sides of the tablet and that the style may be held in a practically-stationary position, and hence does not require a weighted lever or a spring to support it. The record which is herein described may be used with a machine having means for moving the sound-box laterally across the record while the record is merely revolved. In such a machine the record-tablet would be held up to the style by the yielding or resilient portion 3 of the tablet in the same manner as described with the machine shown. The tablets may be comparatively thin, even in the portions upon which the records are embossed or secured, owing to the fact that when embossed the material is rendered dense and compact by the necessary pressure to produce the sound-grooves.

Having thus fully described my invention, what I claim is—

1. A record-tablet having a central flexible portion and a record upon the outer portion.

2. A record-tablet having a thin yielding portion and a thicker non-yielding portion for the record.

3. A record-disk made of celluloid or similar material and having a thin, elastic portion and an outlying non-yielding portion for the record.

4. A record-disk having a central hub, a record upon the face of said disk, and a flexible portion intermediate the hub and record.

5. A record-disk having a yielding portion, a rigid center and a rigid support for a record, in combination with a style.

6. A record-tablet having a non-yielding central hub, a rigid outer record-rim, and an intermediate flexible portion, in combination with a rigid central supporting-pin and a stationary style.

7. A record-disk having a non-yielding central hub secured to a central pin, record on the face of the disk, a flexible portion therein, in combination with a style.

8. A record-tablet having a yielding portion, a rigid support for a record, a stationary style, and means for revolving the tablet and moving it laterally in contact with the style.

9. In a sound-reproducing machine, a style, a record-tablet having a central hub rigidly secured to a central pin, a record on the face of the tablet, a flexible portion in the tablet between the hub and record to hold the record in contact with the style, in combination with means for revolving the tablet.

In testimony whereof I affix my signature in presence of two witnesses.

FREDERICK MYERS.

Witnesses:

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S. W. COCKRELL.