

(No Model.)

2 Sheets—Sheet 1.

L. W. BRIGGS & D. E. BOSWELL.
PHONOGRAPH.

No. 576,081.

Patented Jan. 26, 1897.

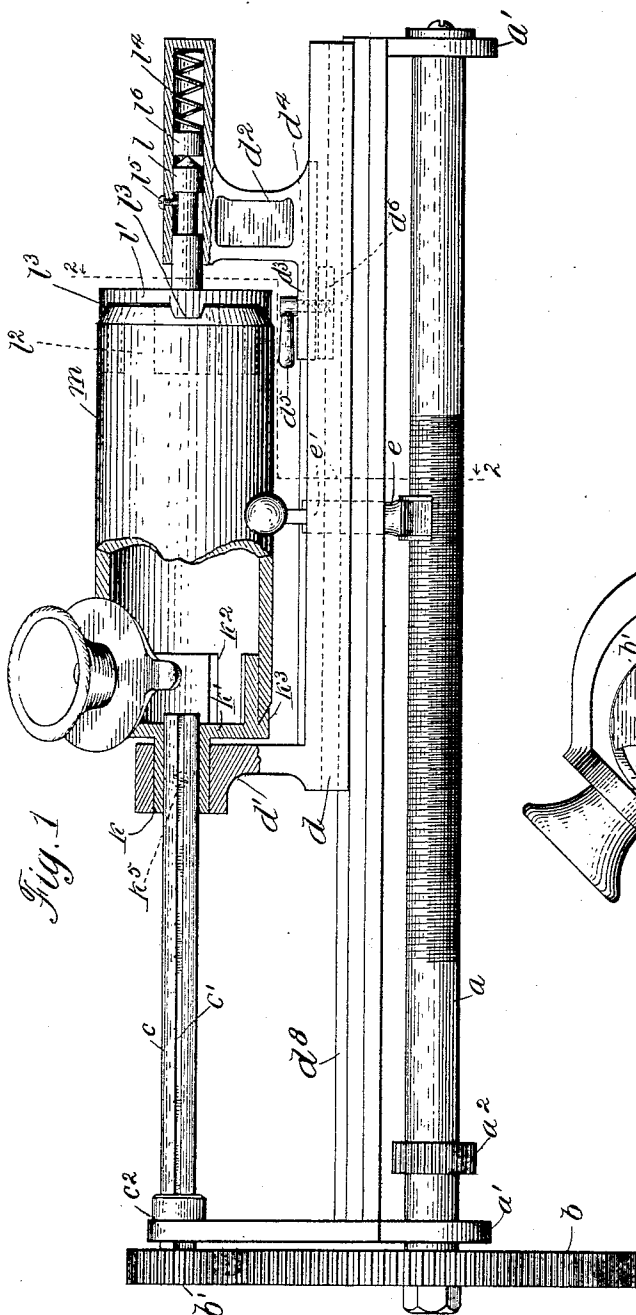


Fig. 1

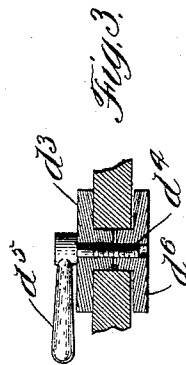


Fig. 3

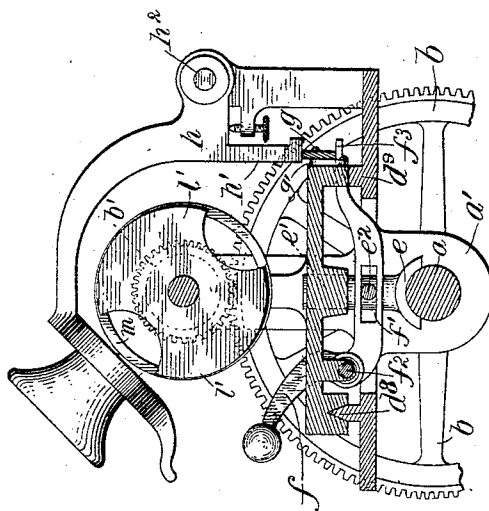


Fig. 2

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Daniel E. Boswell.
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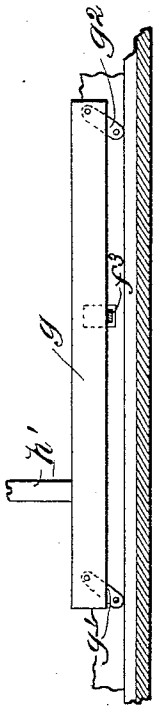


Fig. 2

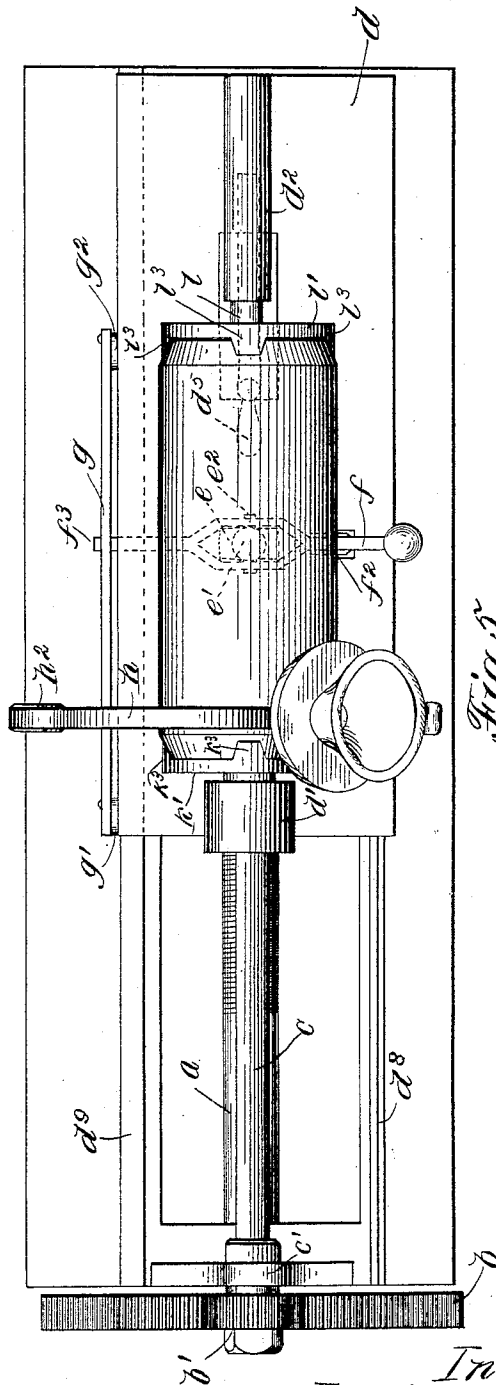


Fig. 3

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UNITED STATES PATENT OFFICE.

LEWIS W. BRIGGS AND DANIEL E. BOSWELL, OF CHICAGO, ILLINOIS; SAID
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PHONOGRAPH.

SPECIFICATION forming part of Letters Patent No. 576,081, dated January 26, 1897.

Application filed September 21, 1895. Serial No. 563,177. (No model.)

To all whom it may concern:

Be it known that we, LEWIS W. BRIGGS and DANIEL E. BOSWELL, citizens of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Phonographs, (Case No. 1,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

Our invention relates to a phonograph, and more particularly to the mechanism for moving the phonograph-cylinder and the diaphragm relatively, our object being to simplify and cheapen the construction of the mechanism, and, furthermore, to provide a construction wherein the wax cylinder may be more readily placed in position and removed than has been possible in constructions heretofore employed.

A further object is to provide mechanism for releasing the traveling parts from the driving-screw and for raising the phonograph-needle from engagement with the wax cylinder when it is desired to move the parts back to their initial positions after the operation of the phonograph.

In phonographs as usually constructed heretofore the wax cylinder has been mounted to rotate, while the diaphragm carrying the needle adapted to engage the surface of the wax cylinder has been mounted upon a carriage adapted to be moved forward by means of a rotating screw. It is usual to rotate the cylinder one hundred times while the needle is traveling through a distance of an inch along the cylinder, and for this purpose it has been customary to provide a rotating screw having one hundred threads to the inch for imparting the desired movement to the diaphragm-needle.

In the phonograph of our invention the diaphragm-needle is mounted stationarily, while the phonograph-cylinder is adapted to be moved longitudinally, the cylinder being mounted upon a carriage adapted to be advanced by means of a rotating screw. Upon the end of the shaft carrying the screw is provided a gear-wheel which meshes with a pinion carried upon the shaft of the cylinder, the ratio of the gear-wheels as preferably em-

ployed being four to one, whereby the cylinder makes four revolutions to each revolution of the screw. The screw may thus be provided with twenty-five threads to the inch to secure the same results as have been secured with a screw having one hundred threads to the inch, as in constructions heretofore employed; that is, as thus constructed a relative movement of one inch between the cylinder and the diaphragm-needle results while the cylinder is rotating one hundred times. We are thus enabled to greatly cheapen the cost of the phonograph, since the cost of an accurately-threaded screw with one hundred threads to the inch is quite expensive, while a screw with but twenty-five threads to the inch can be made of the necessary accuracy quite cheaply.

The phonograph-cylinder is made hollow and is adapted to be clamped between two face-plates carried upon the traveling carriage, whereby the cylinder may be readily placed in position or removed.

A lever is provided upon the traveling carriage carrying the wax cylinder, which, when rocked, is adapted to disengage the carriage from the driving-screw and to lift the diaphragm-needle out of engagement with the surface of the cylinder, whereby the parts may be moved to their initial positions after the operation of the phonograph.

We have illustrated our invention in connection with the accompanying drawings, in which—

Figure 1 is a view in elevation, partially in section, of the phonograph embodying our invention. Fig. 2 is a sectional view on line 2 of Fig. 1. Fig. 3 is a detail view showing the means for fastening in position one of the adjustable standards carried upon the traveling carriage. Fig. 4 is a detail of the parallel rod-movement employed for raising the arm that carries the needle. Fig. 5 is a plain view of the phonograph.

Like letters refer to like parts in the several figures.

The threaded shaft *a* is mounted to rotate in bearings *a'* *a'*, carried upon the frame of the machine, and a driving-wheel *a*² is mounted upon the screw-shaft *a*, whereby the shaft may be rotated. Upon the end of the shaft

a is mounted a gear-wheel b , meshing with the pinion b' , carried upon the shaft c , journaled at one end in a bearing c^2 , carried upon the frame of the machine, and at the other end journaled in a bearing d' , carried upon the traveling carriage d . The carriage d is mounted upon ways $d^8 d^9$, the way d^8 being V-shaped and moving in engagement with the V-shaped groove or channel provided on the carriage, the right line travel of the carriage being thus insured. The way d^9 has a plane surface and is not V-shaped, the necessity of accurately aligning the two ways being thus avoided. Upon the carriage d is carried a half-nut e , adapted to engage the shaft a to move the carriage longitudinally as the shaft rotates. The half-nut e is carried upon a shank e' , moving longitudinally within a bearing provided upon the carriage d , whereby the half-nut may be moved out of engagement with the screw-shaft. For this purpose a pin e^2 , carried upon the shank e' , engages a slot f^1 , provided in the lever f , pivoted at f^2 to the carriage, the rocking of the lever f thus serving to raise the nut e out of engagement with the screw-shaft. The end f^3 of the lever f is adapted to rest beneath a bar g , extending parallel to the carriage and mounted upon links $g' g^2$, pivoted to the side of the carriage. When the lever f is rocked and the end f^3 thereof raised, the bar g is engaged and moved upward into engagement with the extension h' , carried upon the arm h , pivoted at h^2 and carrying upon its end the phonograph-diaphragm. The rocking of the lever f thus rocks the arm h upon its pivot and moves the needle carried upon the diaphragm out of engagement with the wax cylinder. The single lever f thus serves to disengage the sliding carriage from the driving-screw and to move the needle out of engagement with the cylinder, whereby the carriage may be returned to its initial position.

Upon the shaft c and rotating within the standard d' is a sleeve k , splined to the shaft c by means of a pin k^5 , engaging the slot c' in the shaft c . The sleeve thus rotates with the shaft, while the sleeve may move longitudinally relatively to the shaft. Upon the sleeve k is carried the face-plate k' , between which and a similar face-plate l' the wax cylinder m is adapted to be held. The face-plate l' is carried upon a plunger l , adapted to move within a bore provided in the standard d^2 carried upon the carriage d . The plunger l is limited in longitudinal movement by pin l^3 . The plunger l has a cone bearing against a piston l^6 , pressed outward by a spring l^4 , to thus impart to the face-plate l' a yielding outward movement to maintain the wax cylinder firmly in position between the two face-plates.

The standard d^2 carries a horizontal extension d^3 , adapted to move in a slot provided in the carriage. A screw d^4 , provided with a handle d^5 , passes through the extension d^3 and engages a threaded hole provided in the block d^6 , which when the handle d^5 is swung

upon its pivot is clamped against the under face of the carriage to lock the standard d^2 in an adjusted position.

The wax cylinder m is made hollow, and its ends rest upon the cylindrical extensions $k^2 l^2$ of the face-plates, the ends of the cylinder being beveled and adapted to be engaged by the projections $k^3 k^3 l^3 l^3$, provided upon the face-plates.

When it is desired to place the cylinder in position, the handle d^5 is swung to unlock the standard d^2 , after which the standard may be moved to the right to permit the placing of the wax cylinder in position between the two face-plates. The standard d^2 may be then moved to the left and clamped in position to thus secure the wax cylinder in position between the face-plates.

The face-plates are preferably cut away at several points, as shown in Fig. 2, to permit the insertion of the finger to grasp the interior of the wax cylinder as the same is being placed in position. As the shaft a rotates the carriage d is moved to the left, the end of the shaft c projecting into the interior of the wax cylinder as the carriage advances.

When, as constructed in practice, the screw is provided with twenty-five threads to the inch, the carriage moves to the left through the distance of an inch while the cylinder is rotating one hundred times, and the same result is thus produced as results from the constructions heretofore employed, wherein a screw having one hundred threads to the inch was employed.

Instead of providing twenty-five threads to the inch it is evident that any other number may be provided, and any preferred ratio between the gear-wheels b and b' may be adopted, but we find the relations above mentioned to give very desirable results.

When the phonograph-cylinder has moved to the left to its extreme position, the lever f may be rocked to release the carriage from the driving-screw and to move the diaphragm-needle out of engagement with the wax cylinder, and the carriage may then be moved by hand back to its initial position.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a phonograph, the combination with a traveling carriage, of ways whereon the said carriage rests permitting the movement thereof only in a plane parallel with the axis of the phonograph, a phonograph-cylinder rotatably mounted upon the said carriage, a non-traveling diaphragm-needle engaging said cylinder, a driving-shaft for rotating the cylinder, a threaded shaft or screw, meshing gear-wheels connecting the said driving-shaft and screw adapted to rotate the latter at a lower rate of speed, a threaded nut or other part carried upon the traveling carriage normally engaging the said screw and imparting to the said carriage a lateral movement directly proportional to the rate of rotation of the said

phonograph-cylinder, substantially as described.

2. In a phonograph, the combination with a traveling carriage, of a hollow phonograph-cylinder mounted thereon, a non-traveling diaphragm-needle engaging said phonograph-cylinder, a driving-shaft for rotating said cylinder having one end journaled in a stationary bearing and the other end movable longitudinally in a bearing carried upon said carriage, the end of said shaft projecting into the interior of said hollow cylinder as the carriage advances, a threaded shaft or screw mounted in stationary bearings, reducing-gears between said driving-shaft and said screw to cause the shaft to rotate at a higher rate than the screw, a nut or part carried upon the carriage and engaging said screw to propel the carriage as the screw rotates, and means for moving the diaphragm-needle out of engagement with the cylinder and for moving the nut out of engagement with the screw; substantially as described.

3. In a phonograph, the combination with a carriage, of a pair of face-plates mounted upon said carriage, a phonograph-cylinder adapted to be held between said plates, a driving-screw for moving said carriage and a driving-shaft splined to one of said face-plates and geared to said driving-screw; substantially as described.

4. In a phonograph, the combination with a traveling carriage, of a pair of face-plates journaled to rotate in standards carried upon said carriage, one of said face-plates being yieldingly pressed toward the other, a phonograph-cylinder adapted to be held between said plates, a rotating screw for driving said carriage, and a driving-shaft geared to said driving-screw and splined to one of said face-plates; substantially as described.

5. In a phonograph, the combination with a traveling carriage, of a pair of face-plates journaled in standards carried upon said carriage, one of said standards being adjustably movable toward and from the other phonograph-cylinder adapted to be held between said plates, a rotating screw for driving said carriage, and a driving-shaft geared to said

screw and splined to one of said face-plates; substantially as described.

6. In a phonograph, the combination with a traveling carriage, of a phonograph-cylinder adapted to be supported thereby, a driving-screw, a nut carried upon the carriage and adapted to engage said driving-screw, a lever adapted when rocked to disengage said nut from said driving-screw, and means operated by the rocking of said lever for raising the diaphragm-needle from engagement with the phonograph-cylinder; substantially as described.

7. In a phonograph, the combination with the carriage *d* of the driving-screw *a*, the nut *e* carried upon said carriage and adapted to engage said screw, pivoted lever *f* connected with said nut *e*, pivoted arm *h* carrying the phonograph-diaphragm, and the bar *g* linked to the carriage and adapted when raised by the end of the pivoted lever *f* to engage and rock the arm *h* to move the diaphragm-needle out of engagement with the phonograph-cylinder; substantially as described.

8. In a phonograph, the combination with the carriage *d*, carrying the standards *d'* *d''* of the surface-plate *l'* mounted in said standard *d''* and having a yielding longitudinal movement therein, said standard *d''* being adjustably movable toward and from the standard *d'*, the face-plate *k'* mounted in the standard *d'*, the shaft *c* splined to said face-plate *k'*, driving-screw *a* and gears *b* *b'* connecting screw *a* and shaft *c*.

9. In a phonograph, the combination with two face-plates between which the hollow phonograph-cylinder is adapted to be held, of openings in one or both of said face-plates to permit the insertion of the finger to facilitate the placing of the phonograph-cylinder in position; substantially as described.

In witness whereof we hereunto subscribe our names this 14th day of September, A. D. 1895.

LEWIS W. BRIGGS.
DANIEL E. BOSWELL.

Witnesses:

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JOHN W. SINCLAIR.