INSTRUCTIONS

FOR THE

Management and Operation

OF

EDISON'S

SPEAKING PHONOGRAPH

PHILADELPHIA:
BURK & McFETRIDGE, STEAM-POWER BOOK AND JOB PRINTERS, 304 CHESTNUT STREET.
SUCCESSORS TO INQUIRER PRINTING HOUSE.

1878.

EDISON'S

SPEAKING PHONOGRAPH.

DESCRIPTION AND INSTRUCTIONS FOR OPERATING.

The adaptation of this wonderful discovery to the practical uses of commerce and social life not having, as yet, been completed, in all its mechanical details, this company is prepared to offer to the public only that design or form of apparatus which has been found best adapted to its exhibition as a novelty.

Of this class of Phonographs, we make two styles: One for the general purpose of exhibition, and one for the drawing room and scientist's sanctum.

The mechanism of each is precisely the same. The performance differs only in these particulars:

No. 1. The exhibition instrument has a cylinder grooved with twenty-four threads per inch.

No. 2. The drawing room instrument has a cylinder grooved with forty threads per inch.

This gives to No. 2, the advantage of nearly double the recording surface on a cylinder of the same size. It also adds a trifle to the distinctness of the articulation, and approximates more nearly the quality of the voice.

In point of volume of sound, and in general effectiveness in illustrating the working of the apparatus to an assemblage of any considerable number of people, there is no appreciable difference between them.

No. 1. Is all of iron, except the cylinder, which is of brass. The iron work is all neatly japanned and ornamented. It is mounted upon a neat white wood box, in which is a drawer for the small tools and supplies which accompany each machine.

No. 2. Is all of brass, hand-filed and beautifully finished throughout. The fly-wheel, base, etc. being of brass, the instrument is given a rich appearance. It is mounted upon a handsome rosewood and inlaid box, with drawer for tools.

Each instrument is furnished with the following list of Foil, tools, etc:

1. This Letter of Instructions.
2. 5 pounds of special made Record Foil.
3. 1 Oil Stone.
4. 1 Oil Can.
5. 1 Screw-Driver.
6. 1 Centering Pin.
7. 1 Funnel.
8. 1 piece Rubber Cushion.
9. 1 " " for wedge.
10. 1 " Wax Cement.
11. 6 Prepared Stylus'.

Each instrument is packed for shipment in a neatly made box, of 1½ inch stuff, water tight, and with heavy iron handles on the ends. The instrument is so braced in this box as to render its damage in transit well nigh impossible. The outside dimensions of this box, are

Length—2 feet 10 inches.
Width—1 foot 2 inches.
Depth—1 foot 2 inches.
Total weight of instrument and box, 175 pounds.

When properly adjusted the Phonograph will speak loud enough to be distinctly heard by an audience of from three to five thousand people. It is the *character* of the sound that makes this possible, apparently it is barely a fourth as loud as the original voice, yet its "voice" may be heard at an almost equal distance.

Price of No. 1 Instrument, $
" " 2 " $

Terms, part payment in advance, balance C. O. D. No discounts.

No Phonographs loaned or rented.

The Record Foil especially manufactured for the Phonograph, may be had of S. Bergmann & Co., 104 Wooster St., New York. There are thirty sheets to the pound.

It is put up only in 5, 10 and 20 pound boxes. Not more than 20 pounds can be shipped safely in *one* box.

Price, 45 cents per pound. Boxing, 25 cents.

Terms, one-half cash in advance, and balance C. O. D.

Extra Stylus' and Diaphragms may also be had of the same parties.

Price of Stylus', 15 cents each.

" Diaphragms, 10 cents each.

It is very rare for a Diaphragm to give out : in point of fact they improve by use, and are only damaged by carelessness or accident.

No other parts ever require renewal.

DESCRIPTION.

Explanation of figures in accompanying drawings.

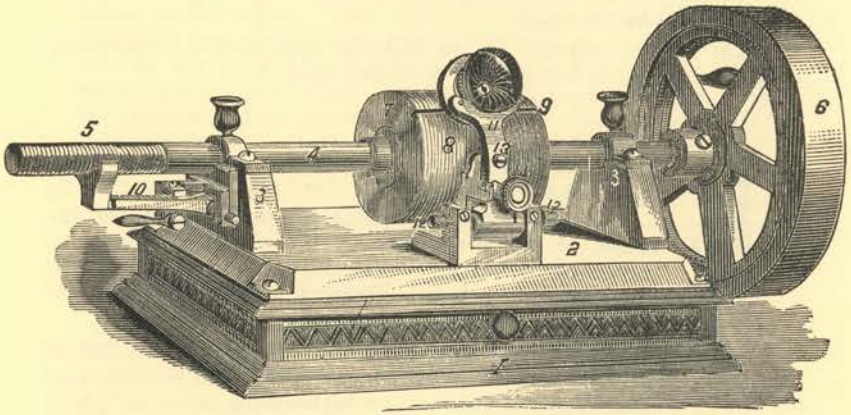

FIG. 1.

1. A box to elevate the instrument to accommodate the fly-wheel which is higher than the instrument proper. This box is furnished with a drawer for tools, etc.

2. The framework of the machine.

3. Two smooth bearings for the shaft.

4. Cast-steel shaft carrying the cylinder.

5. A screw thread upon the end of the shaft, to give the instrument a gradual lateral motion whilst being rotated.

6. Heavy fly-wheel, to give a uniform motion. (Very important.)

7. The cylinder upon which the foil is placed to *receive* and *reproduce* the sound.

8. A screw thread or groove corresponding to that upon the shaft, the object of which is to remove all *support* from under the *foil* at the *precise point where the stylus presses upon it.* Thus permitting the foil to be more readily indented by the stylus than would be possible if the surface underneath the foil was solid.

9. A slot cut across the cylinder to receive the two ends of the foil, and a steel and rubber rod or wedge, which is pressed in on the foil to hold it.

10. An adjustable arm working upon centres, held downward by a flat steel spring, and forced upward by a cam movement, the function of which is to hold a half nut either *in* or *out* of the thread upon the shaft, as it may be desired to carry the cylinder forward with the nut, or slip it back free of it.

11. An upright arm for holding the mouth-piece, diaphragm and stylus combination in proper position.

12. Centre screws for moving the mouth-piece to the right or left, as may be required to bring the stylus to a position *exactly in the centre of a groove.*

13. A screw for regulating the depth of the groove made in the record foil by the stylus.

14. A cam (adjustable), to lock the upright arm in position, while a record is being made or reproduced.

Figure 2.

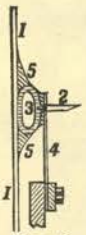

FIG. 2.

1. Diaphragm of mica—a thin plate which vibrates in unison with the voice, or other sounds thrown upon it.

2. A stylus or needle-point for recording the movements of the diaphragm upon the foil, and for retraversing the record thus made, and giving back to the diaphragm its original vibratory movement, and consequently reproducing the sounds.

3. A cushion made of rubber tubing, the function of which is to destroy the too metallic sound which is had from direct metallic contact between the stylus and plate.

4. A steel spring to hold the stylus rigidly in position, weakened near the base so as not to exert any pressure upon the diaphragm.

5. Wax—so placed as to hold the cushion very firmly to the plate, and also the stylus spring firmly to the cushion, (exceedingly important).

Figure 3.

FIG. 3.

1. A hard rubber mouth-piece, into which the vocal or other sounds are thrown.

2. A cushion of rubber tubing, placed across the orifice in the mouth-piece, so that by screwing the mouth-piece into its frame, a pressure of this cushion is had upon the inside of the diaphragm, thus enabling any desired tension to be obtained upon the diaphragm—the end to be obtained being more perfect articulation, and a more natural tone.

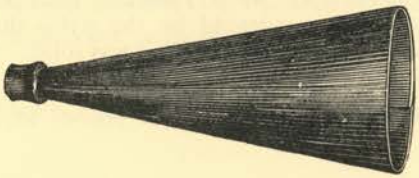

Fig. 4.

A funnel for increasing the volume of sound in the reproduction.

INSTRUCTIONS FOR OPERATING.

1st. *To put the Foil on.*

Keep the foil perfectly free from kinks, draw it firmly around the cylinder, so that when fastened it is perfectly smooth and free from buckles or looseness in every part. Let the under edge pass over the slot just reaching the opposite edge, but not passing it, press the wedge into the slot with the ends of the fingers, deep enough to prevent the stylus from touching it.

2. *The Dampener.* (Fig. 3.)

To dampen the vibrations of the diaphragm, turn the mouth-piece to the right. This causes the rubber tubing to put an increased tension upon the plate. The most ready means of determining the proper tension is to sound a strong note into the mouth-piece while holding the finger lightly on the stylus. When the tension is slack the stylus will prick the finger very decidedly. Keep turning the mouth-piece to the right by small degrees, until the movement of the stylus is perceptibly diminished. It is then ready for use. If it is found upon trial to be dampened too much, it may be readily adjusted to the proper tension by experimenting with the voice.

3. *The Stylus Adjustment.* (Fig. 2.)

The first thing to do in adjusting the stylus is to turn the regulating screw (Fig. 1, No. 13) to the right, enough to prevent the stylus from touching the foil, when the mouth-piece is pressed forward into position; then turn the regulating screw to the left gradually, until it describes a slight line on the foil. Now see to the adjustment of the stylus *into the centre of the grooves* upon the cylinder. To do this, take the pointed iron pin (called a "centre pin"), press the pointed end upon the line described by the stylus. The centre pin will cause the foil to be depressed into the groove nearest the line. You will then be able to see how near the stylus is to its proper position. If too far to the left, take the blunt end of the centre pin and turn the centre screws (Fig. 1, No. 12) to the right gradually, until the line made by the stylus passes directly through the centre of that made by the centre pin, taking care always to keep sufficient tension upon the upright arm, by tightening the centre screws, to enable it to just support the weight of the upright at any angle it may be placed. This is to prevent any side movement of the stylus. Now, the regulating screw may be turned to the left until a groove is made of the proper depth, which is always shown by the sheet of record foil accompanying the instrument; say about 1-32 of an inch deep.

Care must be observed in *locking the upright* into position. It should always be locked *very rigidly* to prevent the mouth-piece from being forced forward when the lips press upon it in speaking, and to ensure its going sufficiently forward at all times to cause the stylus to make the proper depth of groove.

This locking cam (Fig. 1, No. 14) has two adjustments. It is itself a screw, and may be turned further in or out, as may be required to bring the steel lips into the angle slots; and the slots themselves being made at an angle, impose a grip upon the lips as they are pressed into them.

In effecting the adjustment of the stylus, as well also as at all times when using the instrument, observe carefully this

CAUTION:

Never turn the instrument backward, or permit it to drop backward slightly, by checking its momentum with the handle. The surest means of preventing this is to invariably stop the instrument, by placing the hand upon the balance wheel instead of the handle.

Never remove the carrying nut from the shaft thread until the stylus has been withdrawn from the foil; otherwise, the stylus is drawn *across* the grooves and is liable to be broken.

4. *The Movement of the Cylinder.*

The best average rate of speed at which to rotate the cylinder is about sixty revolutions per minute. To reproduce the sounds in as near as possible their original tone, precisely the same speed must be had in the reproduction as in the recording. A uniform speed is very important, especially in the reproduction of all musical tones.

The reversal of the cylinder is effected by releasing the carrying nut (Fig. 1, No. 10), and slipping the shaft to the right, through the smooth bearings, all the while keeping up a *forward* rotation of the cylinder. This maintenance of the rotary movement of the cylinder while the nut is being forced *into* or *withdrawn* from the thread, is important to facilitate the operation of the nut, and to prevent the nut from being locked *on top of the thread* instead of into it.

5. *To effect the best Record.*

To speak to the instrument with the greatest effect, the lips should be placed as far into the mouth-piece as possible, consistent with a clear and distinct utterance of the words. The best tones are the deep, strong chest tones. The best in *quality* is the fine soprano of a lady or child.

6. *Reproduction of the Sounds.*

To reproduce any sounds which have been recorded, return the stylus to the original starting point, by moving the cylinder to

the right, as provided in Article 4. Lock the stylus again in position, place the funnel (Fig. 4) on the mouth-piece, and rotate the cylinder precisely as when making the record.

7. *Renewal, fixing and shape of Stylus.*

This is by far the most important of all the details of the Phonograph. The volume of sound and the perfection of the articulation depend almost wholly on the shape and position of the stylus.

Fig. 2, shows the proper position. The diaphragm, No. 1, should be perfectly flat and free from buckles.

The stylus, No. 2, should be shaped as shown in the drawing, like a chisel with a short bevel, the bevel resting upon the foil parallel with the cylinder.

No. 3, a rubber cushion made of tubing about one-quarter of an inch long. The steel spring, (No. 4), which holds the stylus, should be clamped in the holder, so as to permit the top of it to just reach the centre of the cushion, which cushion is placed exactly in the centre of the plate; this brings the stylus itself, a trifle, say one-sixteenth of an inch *below the centre* of the plate, which has proven to be the most effective position. In cementing this cushion to the plate, and the spring to the cushion, great care must be had to obtain *solidity of contact.* The best method is to place a small piece of wax about half the size of a pea, on the plate, touch it with a heated screw-driver or small flat piece of metal, holding the cushion on with the thumb lightly at first, until the wax has melted and run under the cushion, then putting some pressure on it and causing the remaining wax to form a little bridge between the cushion and the plate, (avoid getting the wax on the upper section of the cushion, as it must have a certain degree of elasticity across its centre), hold the cushion down until the wax has cooled, then repeat the operation on the other side of the cushion. It will be found more convenient to do this by taking the mouth-piece from the upright, and laying it on the table. When the cushion has been thus placed it should be *flat on the bottom.*

To fasten the spring to the cushion, take a piece of wax about one-sixteenth of an inch in diameter, insert it between the spring and the cushion, and hold the heated metal piece on the top end of the spring until the wax has thoroughly melted, pressing it down firmly all the while—as soon as the wax is thoroughly melted, substitute a cool piece for the heated piece, to hold it down until the wax

has thoroughly set, then press the spring down hard with the finger, three or four times, to restore elasticity to the cushion, taking care not to loosen the spring from the cushion, or the cushion from the diaphragm.

If at any time the instrument appears to be less effective than usual, examine the cement between the spring and the cushion, and if not very firmly held, reset it, and, nine times out of ten, the result will be beneficial.

It has been thought well to be thus explicit and elaborate in these instructions, because of the fact that few have ever seen the Phonograph, and have no data by which to judge as to whether or no they obtain the full capacity of the instrument. If these instructions are carefully followed, the most perfect novice will be able to obtain the full capabilities of the Phonograph.

A good strong voice and a distinct utterance are the requisite qualifications of a good operator.

The Edison Speaking Phonograph Co.

66 READE STREET, NEW YORK.

E. H. JOHNSON, *Secretary.*

From the Collection of William Endlein
Facsimile No. 21
Published by Allen Koenigsberg