

E. R. JOHNSON.  
GRAMOPHONE.

(Application filed Feb. 3, 1898.)

(No Model.)

2 Sheets—Sheet 1.

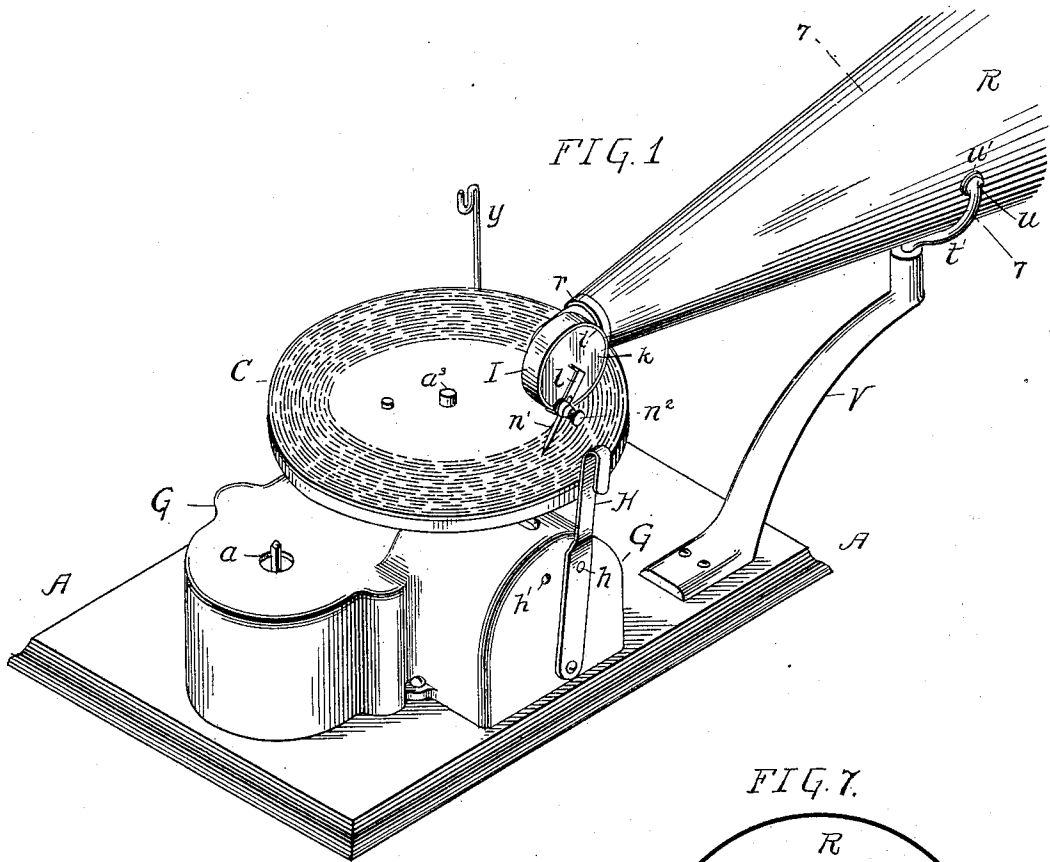
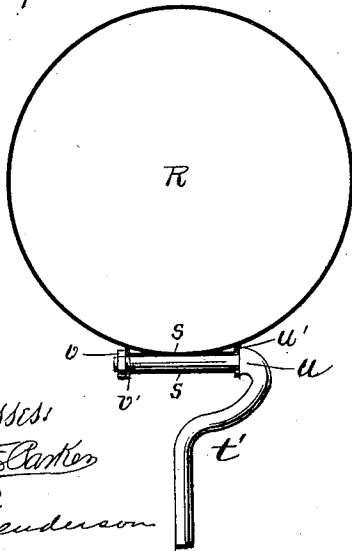
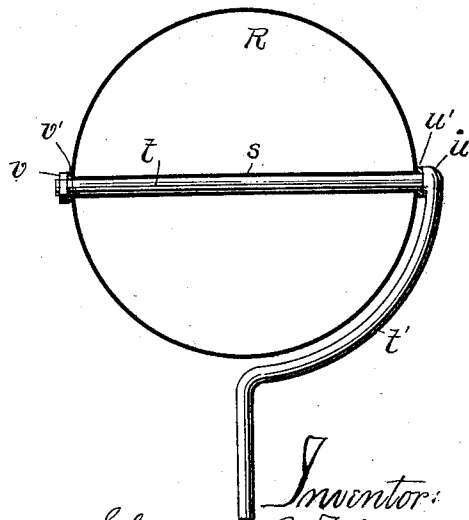


FIG. 8.



Witnesses:  
*Jno. Clarke*  
*J. Henderson*

FIG. 7.



Inventor:  
*Eldridge R. Johnson*  
 by his Attorney,  
*1 Stone & Pettit*

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2 Sheets—Sheet 2.

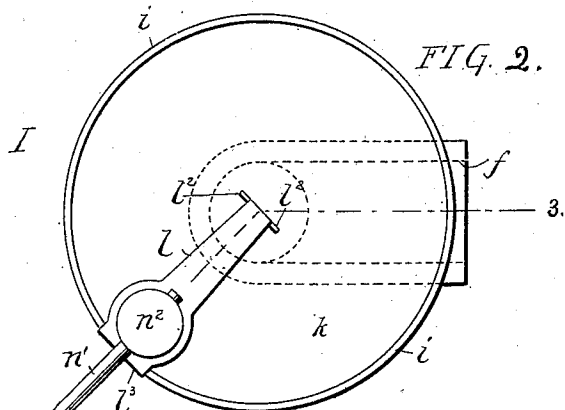


FIG. 2.

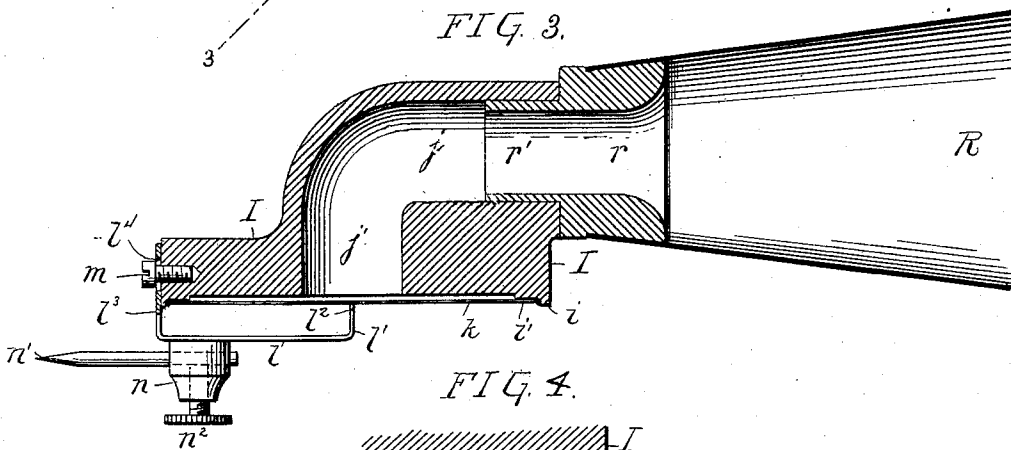


FIG. 3.

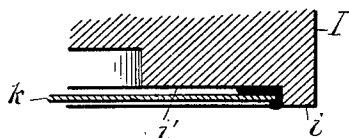


FIG. 4.

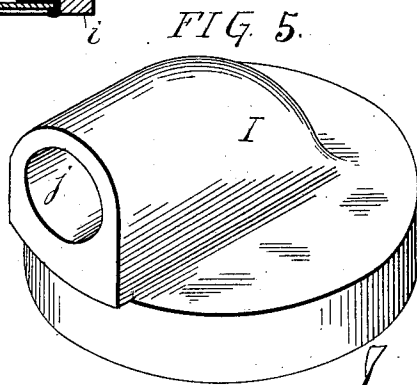
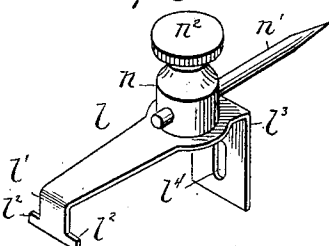


FIG. 5.

FIG. 6.



Witnesses:

*J. M. [Signature]*

*J. Henderson*

Inventor:  
*Eldridge R. Johnson.*  
 by his Attorney,  
*1 Stone Pettit.*

# UNITED STATES PATENT OFFICE.

ELDRIDGE R. JOHNSON, OF PHILADELPHIA, PENNSYLVANIA.

## GRAMOPHONE.

SPECIFICATION forming part of Letters Patent No. 651,076, dated June 5, 1900.

Application filed February 3, 1898. Serial No. 668,938. (No model.)

*To all whom it may concern:*

Be it known that I, ELDRIDGE R. JOHNSON, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Gramophones, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

My invention relates to certain improvements in sound recording and reproducing machines.

One object of the invention is to provide an improved form of sound-box and stylus-carrying bar and to provide for the accurate and delicate adjustment of the stylus-bar with respect to the diaphragm.

A further object of the invention is to provide an improved form of support for the trumpet and to simplify the construction of the same and the connection between the trumpet and the sound-box.

Further objects of the invention are generally to simplify, cheapen, and improve the appearance of the machine, as more fully set forth hereinafter.

In the accompanying drawings, Figure 1 is a perspective view of a sound recording and reproducing machine constructed in accordance with my invention. Fig. 2 is a front elevation of the sound-box. Fig. 3 is a sectional plan view of the same on the line 3 3, Fig. 2. Fig. 4 is a view illustrating a portion of the sound-box drawn to an exaggerated scale. Fig. 5 is a detached perspective view of the rear face of the sound-box. Fig. 6 is a detached perspective view of the stylus and its support. Fig. 7 is a transverse sectional view, on an enlarged scale, on the line 7 7, Fig. 1. Fig. 8 is a similar view illustrating a modification of the structure shown in Fig. 7.

Referring now to the drawings, I represent the sound-box, formed of a single piece of cast metal. The front face of the box is circular in form, and around its outer edge is formed a circular flange *i*, and within the flange is a seat *i'* for the reception of the diaphragm. The rear portion of the box is enlarged to form a channel *j*, connecting with the central opening *j'* at the front face of

the box, but at a right angle thereto, so that the trumpet may be conveniently attached to the box without the expense of auxiliary elbows or joints such as are ordinarily employed.

The diaphragm *k* is formed of a disk of thin sheet metal or other suitable material and is confined in place by a wax or gum of slightly-elastic nature, which will permit of the vibrations of the diaphragm in response to the undulatory movement of the stylus. In fastening the diaphragm in place the sound-box is heated and a quantity of wax is placed all around the seat *i'*. The diaphragm, which is just a trifle less in diameter than the diameter of the recess which it is to occupy, is then carefully pressed down upon the wax, causing some portion of the wax to exude between the periphery of the diaphragm and the inner wall of the flange *i*, as more clearly shown in the exaggerated view.

The stylus-support is in the form of a thin sheet of resilient metal stamped and bent to form a strip *l*, having its two ends bent at right angles to the main body of the strip. The end *l'*, as shown more clearly in Fig. 6, is provided with two outwardly-extending nibs or feet *l<sup>2</sup>*, which rest against the center of the diaphragm and serve to insure a close joint between the diaphragm and the end of the strip, a wax of slightly-elastic nature being employed to bind the two together and extending partly over these two nibs or feet *l<sup>2</sup>*. The opposite end *l<sup>3</sup>* of the supporting-strip is adapted to a small recess formed in the periphery of the sound-box and is provided with an elongated slot *l<sup>4</sup>*, through which passes a securing-screw *m*, the slot permitting of the adjustment of the strip to any desired position and insuring the proper contact between the end *l'* of the strip and the diaphragm *k*. On the strip *l* is secured a boss *n*, having a transversely-disposed opening for the reception of the stylus *n'*, of the usual character, the stylus being held in proper position by a set-screw *n<sup>2</sup>*.

In the recording or reproducing of sound-waves the stylus-supporting strip *l* is so adjusted that the end *l'* of the strip will be in perfect contact with the diaphragm, and as the latter is moved under the impulse of sound-waves or as the stylus is moved in the

reproduction of recorded sound-waves the strip will bend to and fro at the juncture of the portions  $l^3$  of the strip or at a point between there and the edge of the flange  $i$ .

5 The trumpet R is provided at its smaller end with an annular ring  $r$ , from which projects a small circular flange  $r'$ , adapted to enter the opening  $j$  in the sound-box, and thus serving as a means of firmly connecting  
10 the trumpet to the sound-box. About midway between the ends of the trumpet the latter is provided with a diametral tube  $s$ , through which extends a rod  $t$ , secured to or forming part of a supporting-bar  $t'$ , the lower  
15 end of which is adapted to a recess or orifice in a bracket V, projecting from the base A. The upper portion of the bar  $t'$  is curved to conform to the contour of the trumpet and at its juncture with the rod  $t$  is provided  
20 with a shoulder  $u$ , between which and the face of the trumpet is placed a washer  $u'$ , of rubber or other yielding material. At the opposite end of the rod  $t$  is a nut  $v$ , and between this and the face of the trumpet is a  
25 similar washer  $v'$ . By supporting the trumpet in this manner the usual brackets are avoided and the appearance of the instrument materially improved.

In the modified structure shown in Fig. 8  
30 the tube  $s$  is soldered or otherwise secured to the bottom of the trumpet; but otherwise the connection with the supporting-post  $t'$  is the same as that described with reference to Fig. 7.

35 When the instrument is not in use or the record-disks are being changed, the sound-box and trumpet are turned, with the supporting-post  $t'$  as a pivot, until they rest upon a support  $y$ , formed of a strip of wire having  
40 its upper end bent to conform to the contour of the sound-box.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

45 1. The combination of the sound-box, I, having a circular flange,  $i$ , and a diaphragm-seat,  $i'$ , of the diaphragm,  $k$ , of a diameter less than the diameter of the inner wall of the flange,  $i$ , and a quantity of wax between  
50 the periphery of the diaphragm and its seat for holding the same to the sound-box, substantially as specified.

2. The combination of the sound-box, I, having an annular recess,  $i$ , for the reception  
55 of the diaphragm, a diaphragm,  $k$ , of a diameter less than the inner wall of the recess, and an adhesive plastic material inserted in the shoulder formed by the recess,  $i'$ , extending between the periphery of the diaphragm and  
60 the inner wall of the recess and slightly overlapping the front edge of said diaphragm for securing the same in position, substantially as described.

3. The combination of the sound-box, I,  
65 having an annular recess,  $i$ , for the reception of a diaphragm, a diaphragm,  $k$ , of a diame-

ter less than the inner wall of the recess, a wax or other elastic cement inserted back of the diaphragm around the periphery thereof, and extending between the edge of said dia-  
70 phragm and the inner wall of the recess and slightly overlap the front face of the diaphragm, substantially as shown and described.

4. The combination of the sound-box, a di-  
75 aaphragm secured thereto, a stylus, a stylus-supporting bar comprising a thin resilient strip of metal having one end bent at an angle for contact with the diaphragm and its  
80 other end bent and connected to the periphery of the sound-box, and means for adjusting this end of the strip for insuring the proper contact of the opposite end of the strip with the diaphragm, substantially as described.

5. The combination of the sound-box, a di-  
85 aaphragm secured thereto, a stylus, and a stylus-supporting strip,  $l$ , having one of its ends bent at a right angle to the length of the strip and provided with projecting nibs or feet,  $l^2$ ,  
90 for contact with the diaphragm, substantially as specified.

6. A stylus-support comprising a strip of thin sheet metal having its opposite ends bent at a right angle to the length of the strip, one  
95 of such ends being provided with an elongated slot for connection with a support and the opposite end having projecting nibs or feet for contact with a diaphragm, substantially as specified.

7. The combination with the sound-box and  
100 diaphragm of the stylus-support,  $l$ , having its opposite ends bent at right angles to the length of the support and connected respectively to the diaphragm and to the sound-box, a boss,  $n$ , secured to the support and recessed  
105 for the reception of a stylus, and a set screw,  $n^2$ , for holding the stylus in position, substantially as specified.

8. The combination with the sound-box, of a trumpet secured thereto, a transversely-ar-  
110 ranged tube secured to said trumpet, a supporting-bar having its upper end bent and extending through said tube, and means for securing the upper end of the supporting-bar in the transverse tube, substantially as de-  
115 scribed.

9. The combination of the trumpet, a trans-  
verse tube,  $s$ , secured to or formed integral therewith, a supporting-bar,  $t'$ , having a rod,  
120  $t$ , secured to or formed integral therewith and extending through said tube, a nut,  $v$ , on the outer threaded end of said rod and washers of yielding material arranged in contact with  
125 the opposite sides of the trumpet, substantially as specified.

In witness whereof I have hereunto set my hand this 2d day of February, A. D. 1898.

ELDRIDGE R. JOINSON.

Witnesses:

FRANK D. GRAHAM,  
HORACE PETTIT.