

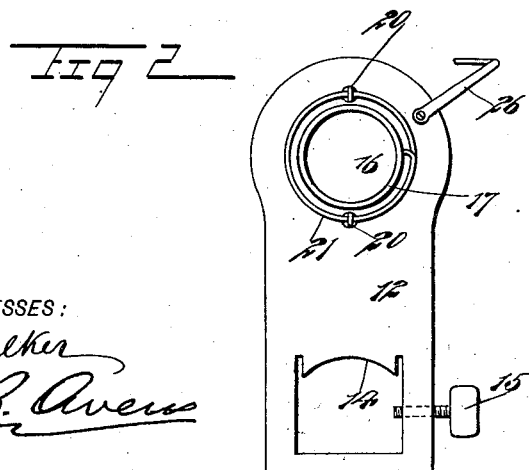
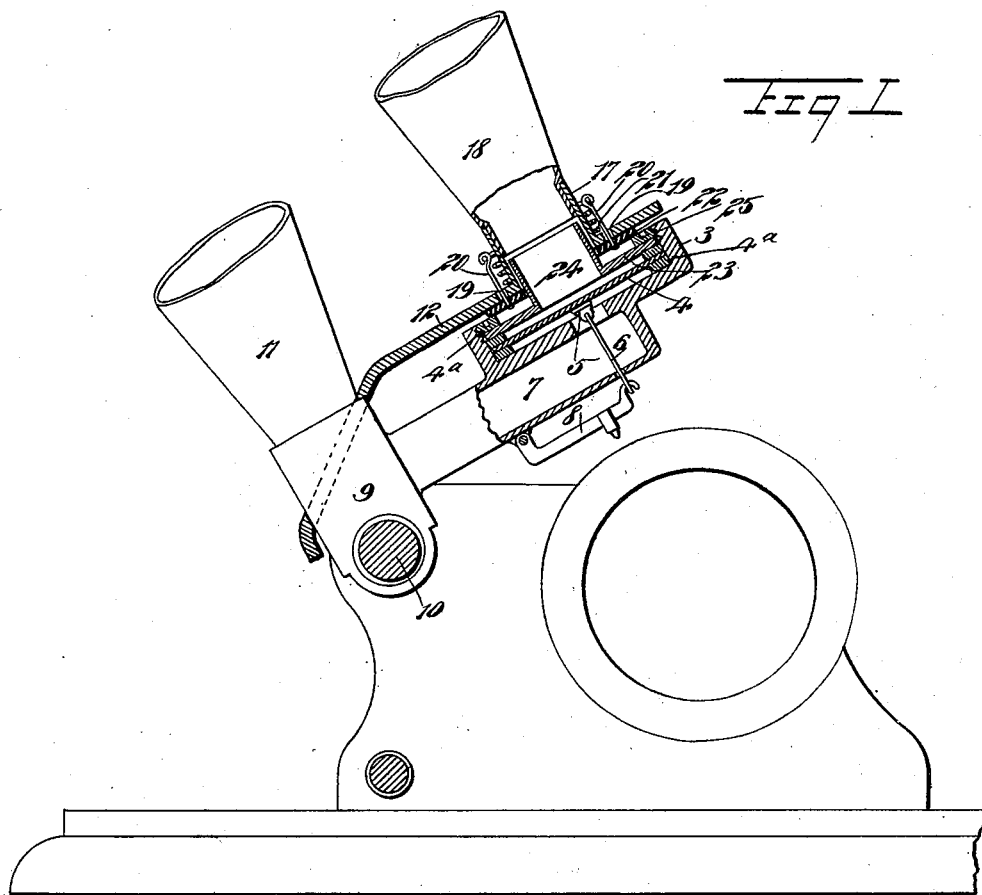
No. 646,370.

Patented Mar. 27, 1900.

F. W. NOLTE.  
SOUND REPRODUCER.  
(Application filed Feb. 20, 1899.)

(No Model.)

2 Sheets—Sheet 1.



WITNESSES:  
*H. Walker*  
*Jose B. Owens*

INVENTOR  
*Frederick W. Nolte*  
BY *[Signature]*  
ATTORNEYS.

No. 646,370.

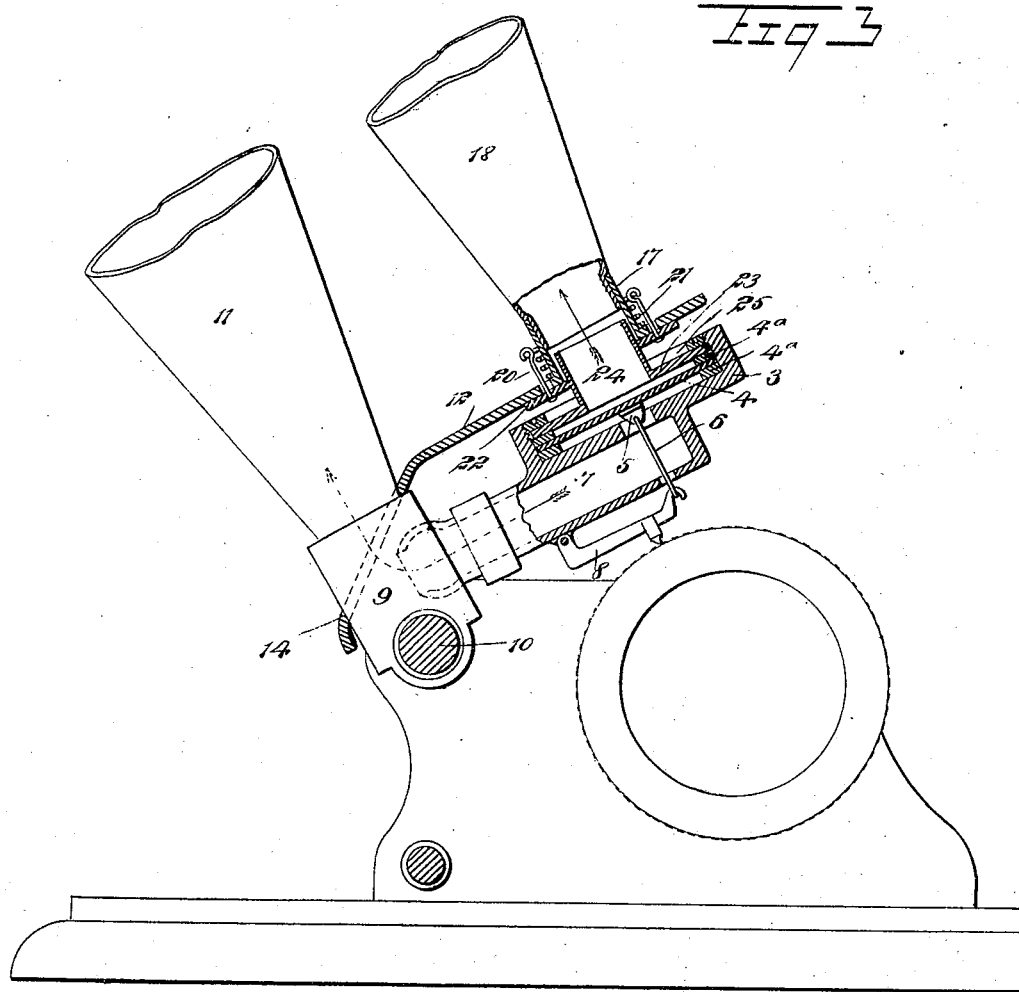
Patented Mar. 27, 1900.

F. W. NOLTE.  
SOUND REPRODUCER.

(Application filed Feb. 20, 1899.)

(No Model.)

2 Sheets—Sheet 2



WITNESSES:

*H. Walker*  
*Isaac B. Owens*

INVENTOR

*F. W. Nolte*

BY

*Mumford*  
ATTORNEYS

# UNITED STATES PATENT OFFICE.

FREDERICK W. NOLTE, OF VICTORIA, BRITISH COLUMBIA, CANADA.

## SOUND-REPRODUCER.

SPECIFICATION forming part of Letters Patent No. 646,370, dated March 27, 1900.

Application filed February 20, 1899. Serial No. 706,193. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK W. NOLTE, a citizen of the United States, residing in Victoria, in the Province of British Columbia and Dominion of Canada, have invented a new and Improved Sound-Reproducer, of which the following is a full, clear, and exact description.

The purpose of this invention is to provide for phonographs, graphophones, and like instruments in which a gravity-reproducer is used a reproducer by means of which the sound-waves may be taken from each side of the diaphragm in contradistinction to taking the sound-waves from only one side of the diaphragm.

This specification is the disclosure of one form of my invention, while the claims define the actual scope thereof.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar characters of reference indicate corresponding parts in all the figures.

Figure 1 is an end elevation showing a graphophone in outline and illustrating my invention in section, the parts being adjusted to be out of active position. Fig. 2 is a plan view showing the horn-holder; and Fig. 3 is a view similar to Fig. 1, except that the parts are shown in operative position.

The casing 3 of the reproducer contains the usual diaphragm 4. To this diaphragm a head 5 is attached, and this head in turn is connected with a wire 6, which passes through an opening in the bottom of the casing 3, and also transversely through a tube 7, which leads the sound-waves from the bottom of the diaphragm. The wire 6 is in connection with the free end of the reproducing-lever 8, the point of which bears on the cylinder of the graphophone, as usual. The tube 7 is mounted to swing on and communicate with the box 9 of the carriage of the apparatus, which is mounted to move along the shaft 10, all of which is in common use in the art. The box 9 is in communication with a horn 11, which horn serves to radiate the sound-waves which pass from the bottom of the diaphragm through the tube 7 to the box 9. A horn-holding plate or support 12 is provided with an opening 14, fitting around the box 9 in the manner shown. The plate 12 has a set-screw 15, whereby to fasten the plate rigidly to the

box. This plate 12 projects transversely over the casing 3 and is formed with an opening 16, (see Fig. 2,) which is surrounded by a perpendicularly-extending tube 17, fastened rigidly to the plate 12 and serving to carry the horn 18, which serves to radiate the sound-waves from the upper side of the diaphragm 4. The plate 12 is provided with two openings 19, located, respectively, on opposite sides of the tube 17. Through these openings 19 are passed pins 20, which are in connection with an expansive spiral spring 21, bearing on the plate 12 and surrounding the tube 17. Located on the under side of the plate 12 and attached to the pins 20 is a flat ring 22, which by means of the spring 21 is drawn into close contact with the under side of the plate 12.

Fastened in the casing 3 and over the diaphragm 4 is a circular plate 23, which has a central opening therein surrounded by an upwardly-extended tube 24. This tube 24 projects through ring 22 and the opening 16 in the plate 12 and upward into the tube 17, so that the sound-waves radiating from the upper side of the diaphragm may pass out through the tube 24 into the horn 18. The ring 22, fitting snugly around the tube 24, serves to prevent the escape of sound-waves between the tubes 17 and 24. At the same time the spring-mounting of the ring 22 allows the tube 24 free movement in a manner to be fully described hereinafter. Screwing into the upper side of the casing 3 is a ring-nut 25, which bears down on the plate 23 to hold the same rigidly in place, the diaphragm being sustained between two gaskets or spacing-rings 4\*, so that the diaphragm is held out of contact with the bottom of the casing 3 and with the plate 23, whereby to permit unrestrained vibration of the diaphragm. The plate 12 carries a swinging clamping-arm 26, which arm serves to engage the under side of the casing 3 to hold the casing raised against the plate 12 when the apparatus is not in use, as shown in Fig. 1.

The plate 12 being rigidly fastened on the box 9 of the carriage of the apparatus and supporting the horn 18 when the reproducer is not in use, the tube 7, with the casing 3 and the attached parts, should be moved up to the position shown in Fig. 1 and held in such position by the clamp 26, engaged with the parts 3 and 12, as shown. This raises the

stylus from the record, as the view illustrates. When it is desired to use the reproducer, the clamp 26 should be released, thus permitting the tube 7, with its attached parts, to drop 5 and bear the stylus on the record, the stylus being pressed on the record by the whole weight of the casing 3 and the tube 7 and parts carried thereby. The diaphragm 4 being vibrated, the sound-waves will pass from 10 each side of the diaphragm through the tubes 7 and 24, respectively. The ring 22, being very delicately sustained by the spring 21, does not in any way interfere with the free movement of the tube 24, which freedom of 15 movement is necessary to the tube and the casing 3 thus to permit the proper action of the stylus on the record. After the operation has been completed the tube 7, with the attached casing, should again be raised to the 20 position shown in Fig. 1 and held there by the clamp 26.

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

25 1. The combination with a talking-machine or like instrument, comprising a carriage and a tube mounted to swing thereon and communicating therewith, of a support rigidly attached to the carriage, a horn carried by the 30 support, a casing held by the tube, and moving with the same, a diaphragm mounted in the casing, a reproducing-lever supported by the tube and having connection with the diaphragm at one side thereof, the tube conducting sound-waves from the said side of the diaphragm, a closure for the casing at the other 35 side of the diaphragm, a tube supported by said closure and leading to the horn of the support to conduct the sound-waves from the other side of the diaphragm, and a clamp for 40 joining the casing and support.

2. The combination, with a talking-machine or like instrument, comprising a carriage and a tube mounted to swing thereon and communicating therewith, of a casing attached to the tube and communicating therewith, a diaphragm mounted in the casing, the tube conducting the sound-waves from one side of the diaphragm, a reproducing-lever mounted on 50 the tube and having connection with the diaphragm at the side adjacent to the tube, a closure for the casing at the other side of the diaphragm, a tube carried by the closure and leading the sound-waves from the other side 55 of the diaphragm, a support mounted on the carriage, a horn held by the support, a ring sustained on the support encircling the tube of the closure, the said tube of the closure communicating with the horn of the support, 60 and a clamp for joining the casing and support.

3. A talking-machine or like instrument, having a carriage supporting a horn and a tube mounted to swing on the carriage, the 65 tube leading to the horn, a casing mounted on the tube, a diaphragm mounted in the casing, the tube conducting the sound-waves

from one side of the diaphragm, a stylus supported by the tube and having connection with the diaphragm, a closure for the casing 70 at the side opposite the tube, a tube carried by the closure and conducting the sound-waves from the side of the diaphragm opposite the first-named tube, a support mounted on the carriage and overhanging the casing, 75 and means carried by the support and communicating with the closure-tube for conducting the sound-waves from said tube.

4. A talking-machine having a carriage, means for conducting the sound-waves, such 80 means being supported by the carriage, a tube mounted to swing on the carriage and communicating with said means, a support mounted on the carriage, a second means for conducting the sound-waves, such second 85 means being carried by the support, a casing mounted on the tube, a diaphragm mounted in the casing, the said tube leading the sound-waves from one side of the diaphragm, a tube 90 mounted at the other side of the diaphragm and leading the sound-waves therefrom into the said second means, and means for removably joining the casing with the support, to sustain the casing.

5. A talking-machine, or like instrument 95 having a carriage, means mounted on the carriage for conducting the sound-waves therefrom, a support carried by the carriage, a second means mounted on the support for conducting the sound-waves, diaphragm de- 100 vices mounted to swing on the carriage, the said means for conducting the sound-waves leading from the respective sides of the diaphragm, and means for removably connecting the diaphragm devices with the support. 105

6. The combination, with a talking-machine comprising a carriage and a tube mounted to swing thereon, of diaphragm devices 110 carried by the tube and comprising a gravity-reproducer, the tube serving to conduct the sound-waves from the one side of the diaphragm, a support mounted independently of the diaphragm devices, and means for conducting the sound-waves from the other side 115 of the diaphragm, such means being held by the said support.

7. In a talking-machine, the combination with a carriage and a tube mounted to swing thereon, of a horn mounted on the carriage and communicating with the tube, diaphragm 120 devices held by the tube, the tube conducting the sound-waves from the lower side of the diaphragm, a support mounted on the carriage, a second horn held by the support and serving to conduct the sound-waves from 125 the upper side of the diaphragm, and means for connecting the diaphragm devices and tube with the support to sustain said devices on the support.

FREDERICK W. NOLTE.

Witnesses:

ALEC McCARTER,  
SIDNEY W. SMITH.