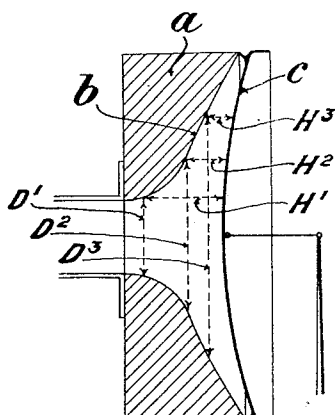


L. LUMIERE.
ACOUSTICAL INSTRUMENT.
APPLICATION FILED MAY 18, 1910.

1,039,155.

Patented Sept. 24, 1912.



Witnesses:
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UNITED STATES PATENT OFFICE.

LOUIS LUMIERE, OF LYON, FRANCE.

ACOUSTICAL INSTRUMENT.

1,039,155.

Specification of Letters Patent.

Patented Sept. 24, 1912.

Application filed May 18, 1910. Serial No. 561,928.

To all whom it may concern:

Be it known that I, LOUIS LUMIERE, a citizen of the Republic of France, residing at Lyon, in the Republic of France, have invented certain new and useful Improvements in Acoustical Instruments, of which the following is a full, clear, and complete disclosure.

This invention relates to improvements in acoustical instruments such as telephones, microphones, stethoscopes, talking machines, musical instruments, and in general any instrument used for the reception or transmission of sounds.

The invention is described below and illustrated as applied to the sound box of a talking machine.

The invention is particularly applicable to those acoustical instruments in which there is a sound box comprising a substantially stationary wall or side in which there is an opening leading to the ear piece or trumpet or other sound delivering means, and a rigid movable side reciprocated toward and away from the stationary side by suitable means such as the stylus of the talking machine, the said movable side moving in substantially unchanged form throughout its whole area.

In the sound boxes of talking machines and other acoustical instruments the displacement of the movable wall has the effect of producing at the level of the orifice leading to the horn variations in pressure in the air within the sound box. These variations constitute the origin of the production of the sounds and are accompanied by a displacement of the air contained within the sound box, a displacement which travels alternately from the orifice to the periphery of the sound box, and from the periphery to the orifice. If the internal form of the stationary wall is not correct, the displacement of the air within the sound box is subject to variations in speed which give rise to disturbances which absorb work and are injurious to the purity of the sound produced. The method of construction which forms the subject of the present invention overcomes this objection and insures a maximum of effect being obtained with the apparatus.

The invention will be clear upon reference to the accompanying drawing which shows a sectional elevation of a circular sound box constructed according to this invention.

The invention consists in giving the inner face *b* of the stationary wall *a* such a form

that the surface of all cylindrical sections taken between it and the movable wall *c* concentrically with the axis of the orifice are equal; that is to say, if the diameters of these sections are taken as D^1 , D^2 , D^3 , and the height of these sections are taken as H^1 , H^2 , H^3 , the surfaces of the cylinders $D^1 H^1 = D^2 H^2 = D^3 H^3$, etc. It will be understood that under these conditions the instantaneous pressure of the air will be uniform at all points of the surface of the wall *c*, so that the objection referred to above will be avoided and the flow of air in the sound box produced or producing the sounds, toward and away from the orifice will be practically unaffected by the displacement of the movable wall.

It is to be understood that this improvement is applicable whatever may be the form of the movable wall *c*, the interior face *b* of the fixed side *a* being always determined by the same conditions.

Having thus described my invention, what I claim and desire to protect by Letters Patent of the United States, is:—

1. A sound box for acoustical instruments comprising a movable wall and a stationary wall in which the inner face of the movable wall bears such a form in relation to the inner face of the stationary wall that the surfaces of successive sections taken concentrically with the delivery orifice of the sound box between the inner faces of the two walls are substantially equal.

2. A sound box for acoustical instruments comprising a stationary wall provided with a delivery orifice, and a movable wall arranged opposite the inner surface of said stationary wall, the inner surface of said movable wall and the inner surface of said stationary wall converging radially outwardly toward each other, the surfaces of successive cylindrical sections taken coaxially with said delivery orifice between the inner faces of said walls being substantially equal.

3. A sound box for acoustical instruments comprising a stationary wall provided with a delivery orifice, and a movable wall having an inner convex surface opposed to the inner surface of said stationary wall and opposite said orifice, the inner surfaces of said stationary wall and said movable wall converging radially outwardly from said orifice toward each other and the surfaces of successive cylindrical sections taken

coaxially with said delivery orifice between the inner faces of said walls being substantially equal.

4. In a sound box, the combination of a
5 fixed wall having a delivery opening coaxial therewith, and a movable wall, the distance between any point in the stationary wall and the point in the movable wall opposite thereof, measured along a line parallel with the
10 axis of said walls, being the quotient of a

constant, divided by the distance between the said point in the stationary wall and the axis of said sound box.

In witness whereof I have hereunto set my hand this twenty-sixth day of April, A. D. 15
1910.

LOUIS LUMIERE.

Witnesses:

GASTON JEAUNIAUX,
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