

(No Model.)

W. BRUENING.

APPARATUS FOR RECORDING SPEECH OR OTHER SOUNDS.

No. 486,394.

Patented Nov. 15, 1892.

Fig. 1.

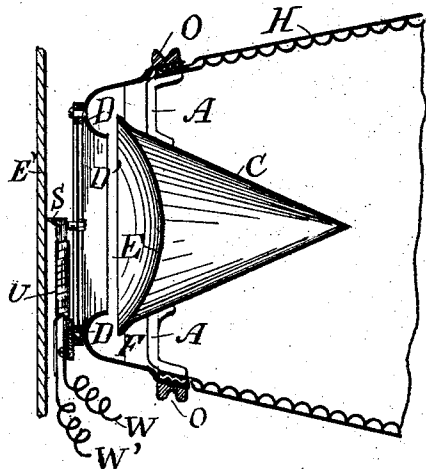


Fig. 3.

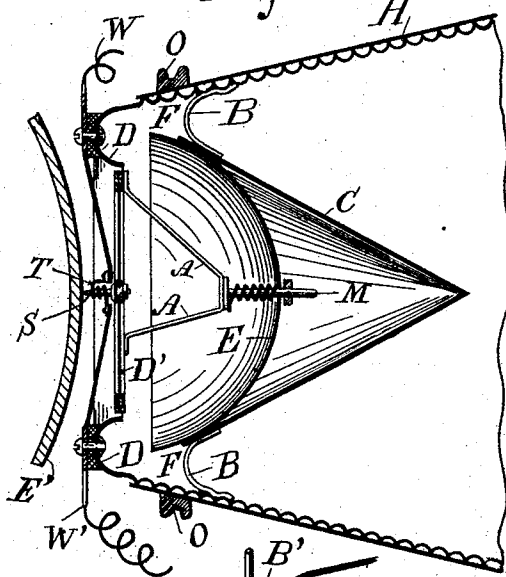


Fig. 2.

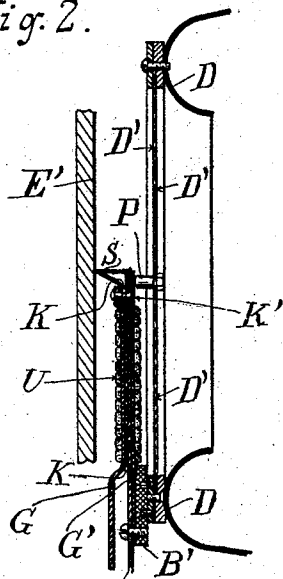
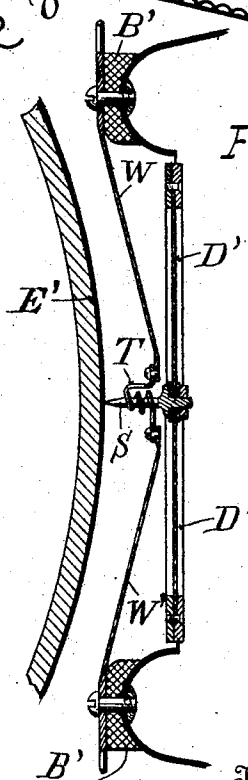


Fig. 4.



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UNITED STATES PATENT OFFICE.

WILLIAM BRUENING, OF EAST ORANGE, NEW JERSEY.

APPARATUS FOR RECORDING SPEECH OR OTHER SOUNDS.

SPECIFICATION forming part of Letters Patent No. 486,394, dated November 15, 1892.

Application filed July 23, 1891. Serial No. 400,451. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM BRUENING, a citizen of the United States, residing in the township of East Orange, in the county of Essex and State of New Jersey, have invented a new and useful Improvement in Apparatus for Recording Speech or other Sounds, of which the following is a specification.

My invention relates to the apparatus for directing the sound-waves upon the diaphragm or other vibrating mechanism in a phonograph, to the improved apparatus for recording sound-waves, and to the means of heating a recording-style used for the purpose.

The objects of my invention are to obtain a more perfect action of the diaphragm and style in making a record of sound-waves in or on solid resisting material and of providing an efficient method of imparting heat to the style for the aforesaid purpose.

I attain the objects of my invention by the means set forth and described in this specification and illustrated in the accompanying sheet of drawings, in which—

Figure 1 is a vertical sectional view of a part of the horn or sound-conveyer, of the diaphragm, sound-wave reflecting devices, style, and section of a phonographic record or tablet. Fig. 2 is an enlarged sectional view showing the construction of style in connection with the diaphragm and tablet and the method of establishing the same in an electrical circuit. Fig. 3 is a modification of Fig. 1, showing variations in the method of supporting the diaphragm and heating the style by electricity when not in circuit; and Fig. 4 is an enlarged view of the last-mentioned part of the same.

Similar letters represent similar parts throughout the figures.

H is the horn or part of the horn or sound-conveyer, which is provided at its smaller end with the inwardly-projecting annular concave reflector D.

C is a deflector, preferably of cone shape, and is held within the horn H by the brackets B, leaving the annular space F between its large end and the inside of the horn, through which sound-waves are deflected upon the annular concave reflector or reflecting-surface D. The large and forward end or

base of the cone-shaped deflector C has the shape of a concave reflector E, which may be spherical or parabolical, and has in front of it the diaphragm D', the center of which is located at the focus of the spherical reflecting-surface E, supported either upon the back or convex side of the deflecting-surface, as shown in Fig. 1, or by arms A and stem M, as shown in Fig. 3.

The style S, Figs. 1 and 2, which may be of any suitable shape and construction and is made of electrical resisting material, is located in an electrical circuit of which W W' are the wires.

G G' are springs, preferably made flat and of good conducting material, bearing upon the post P of the diaphragm and located in the circuit, and they are electrically connected at one end by the style S. Strips of mica K K' properly insulate the two springs, the ends of the style, and all these parts from the post of the diaphragm.

U is a rubber band or strip. (Shown in section in Fig. 2.)

The post P, supporting the style and circuit, may be made of non-conducting material, which is wound around the springs and inclosed mica strips for insulating purposes and for the purpose of securing the parts together.

B' is a hard-rubber block which gives insulated support to the springs and style.

O O are shoulders for securing the horn in its frame or holder by means of set-screws or a clamp or other suitable device.

The operation of the apparatus is as follows: Sound-waves developed within the horn H are deflected through the annular passage F upon the reflecting-surface D, thence upon the concave reflecting-surface E behind the diaphragm D', and therefrom upon the center of the adjacent side of the diaphragm D'. The force exerted by the sound-waves is thereby applied to the least resisting part of the diaphragm and a better effect obtained than when it is directed upon the whole surface thereof.

When the apparatus is about to be operated for the purpose of making the record, the circuit of the wires W W' is closed and the style S becomes heated by the friction of the electrical current, and by the action of the style and the aid of the heat imparted thereby re-

cords the sound-waves in the material of the
 tablet E', which is composed of some fusible
 material or material which may be softened
 by heat and which is firm at ordinary tem-
 5 peratures. It is unnecessary to describe the
 style in detail, except to say that it must
 be of such construction and dimensions and
 such material that a suitable electrical cur-
 10 rent will heat the style to a sufficient extent
 to make the record in or on the aforesaid re-
 cording material and in such manner, accord-
 ing to the recording method employed.

Figs. 3 and 4 show modifications in the
 method of supporting the diaphragm and also
 15 in the method and apparatus for heating the
 style, which consists of a coil, preferably of
 platina wire T, surrounding the style S. The
 style is properly insulated from the dia-
 phragm if the latter is an electrical conductor,
 20 and, as shown in Fig. 4, by washers of non-
 conducting material between the diaphragm
 and the shank and shoulders of the style, and
 the platina wire being located in an electri-
 cal circuit and heated by an electrical cur-
 25 rent heat is communicated to the style either
 by conduction or radiation for the purpose
 of making the record in the recording mate-
 rial or tablet. I preferably support the style
 S, and to some extent the diaphragm D', in
 30 one—say the most forward—of the coils of
 the platina wire T, and through the contact
 given by such support the heat generated in
 the platina wire may be transferred to the
 style by conduction, and heat may also be
 35 transferred to the style from the other parts
 of the coiled platina wire which do not make
 contact therewith by radiation; but I do not
 confine myself to either radiation or conduc-
 tion exclusively, since the amount of heat
 40 required depends largely upon the fusibility
 of the material composing the tablet and in
 which the record is to be made.

The horn or sound-conveyer and reflector,
 as well as the style herein shown, may be
 used in connection with my apparatus shown 45
 in my application already allowed in phono-
 graphs, Serial No. 377,724, filed January 14,
 1891.

I claim as my invention—

1. In a phonograph, a horn or sound-con- 50
 veyer, one end of which projects inwardly
 and forms a concave annular reflector, in
 combination with a spherical reflector, a dia-
 phragm which presents its inner side to the
 concave surface of the spherical reflector and 55
 is supported by its frame on the convex sur-
 face of the annular reflector, and a recording-
 style which is supported on the outer side of
 said diaphragm.

2. In a phonograph, a style consisting of a 60
 loop of an electrical circuit, the two limbs of
 which are insulated from each other and from
 the diaphragm, and the end of which loop is
 provided with a suitable point for making the
 record in a phonograph record-blank. 65

3. In phonographs, a style S, consisting of a
 loop of an electrical circuit-wire, the point of
 which is formed by an acute angle in the
 bend of the loop, the two sides of the loop in- 70
 sulated from each other by the insulating ma-
 terial K and the whole being insulated from
 the diaphragm.

4. In phonographs, the style S, springs G G',
 and insulating material K K', in combination.

5. In phonographs, the style S, springs G G', 75
 insulating material K K', and rubber block B',
 in combination.

6. In phonographs, the style S, springs G G',
 insulating material K K', rubber block B', and
 rubber band U, in combination.

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Witnesses:

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