No. 632,015. Patented Aug. 29, 1899

G. L. HOGAN.

GRAPHOPHONE.

(Application filed Apr. 15, 1899.)

(No Model.)

Fig. 1

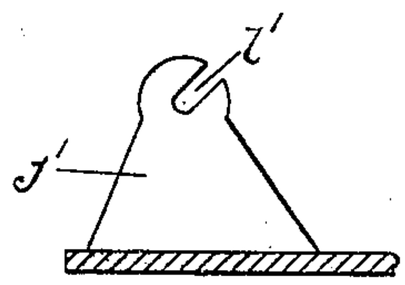


Fig. 3.

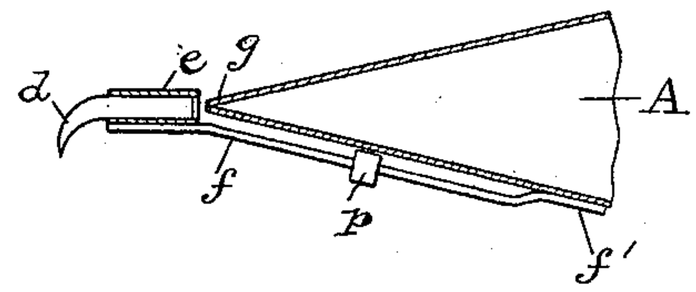


Fig. 2.

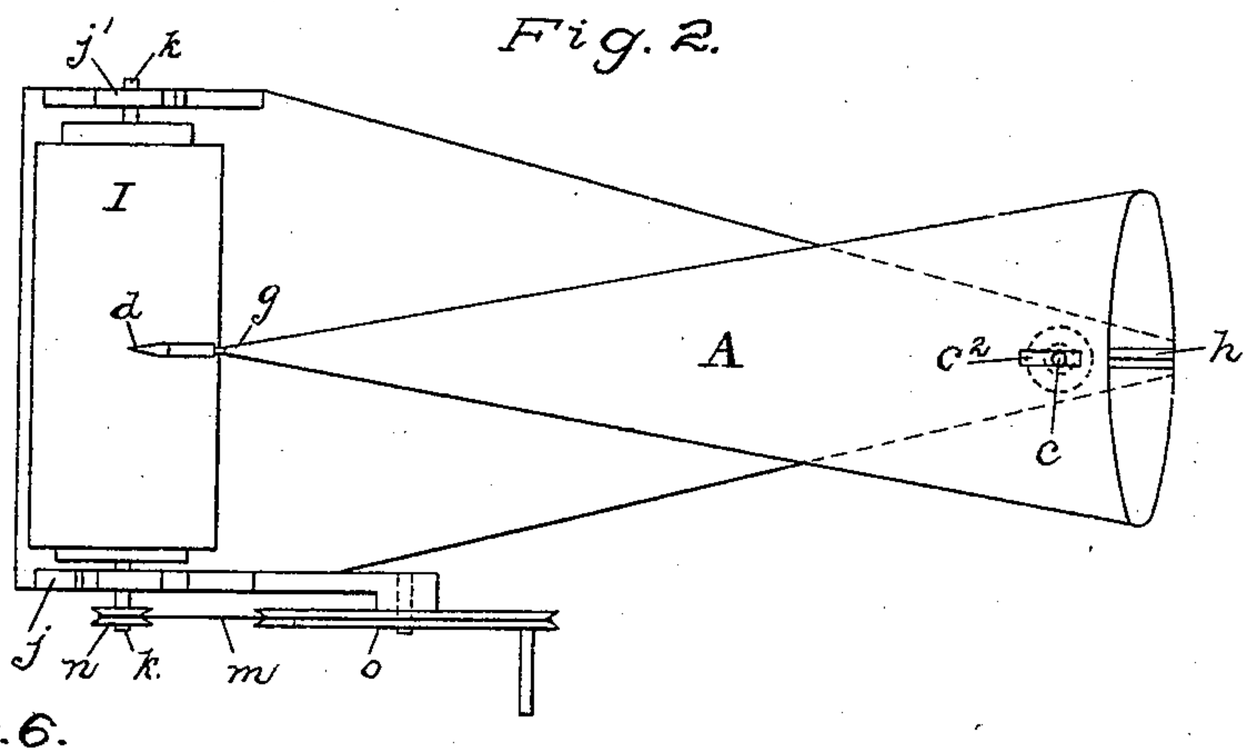


Fig. 6.

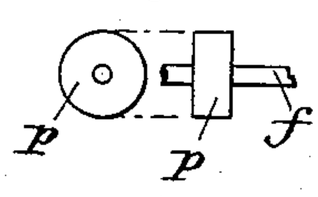
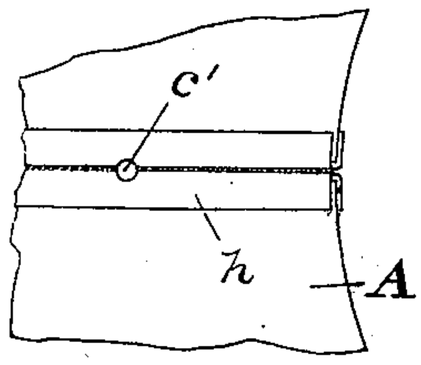


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

GEORGE L. HOGAN, OF BALTIMORE, MARYLAND.

GRAPHOPHONE.

SPECIFICATION forming part of Letters Patent No. 632,015, dated August 29, 1899.

Application filed April 15, 1899. Serial No. 713,078. (No model.)

To all whom it may concern:

Be it known that I, GEORGE L. HOGAN, a citizen of the United States, residing at Baltimore, in the State of Maryland, have invented certain new and useful Improvements in Graphophones, of which the following is a specification.

My invention relates to improvements in graphophones or devices designed for reproducing articulate speech or other sounds recorded on phonograms or sound-writings.

The object of my invention is to provide a device or mechanism of a simple, cheap, and durable construction by means of which such phonograms or sound-writings may be accurately and perfectly audibly produced without any attendant disagreeable scraping, grating, or other interfering noise resulting from the action of the mechanism.

My invention consists of a sound-generator in the form of a trumpet of conical shape made of a tough quality of paper, vulcanized fiber, or other material and having a rigidly-attached small rod of hard material, the extremity of which is brought to a fine point and bent so as to fit in the spiral grooves of the phonogram-writing and pivoting said trumpet.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a sectional view of a portion of the base on which the cylinder is mounted. Fig. 2 is a top view of the machine complete. Fig. 3 is a sectional view of the point end of the trumpet on a somewhat larger scale. Fig. 4 is a side elevation of the complete machine. Fig. 5 is a detail view of part of the trumpet, showing the manner of joining its edges. Fig. 6 is a detail view of the adjustable cushion.

The large end of the trumpet A rests on a stud *b*, where it is pivoted loosely on a vertical rod *c*, extending from the stud upward. This gives the point end of the trumpet a free lateral swinging movement. The trumpet has on its lower side a hole *c'* and on its upper side a slot c^2, through which the rod passes. The longitudinal slot c^2 affords a slight range of up-and-down movement to the point end. A hard downward-curved point *d* is attached to the small end of the trumpet, and said point rests on the phonogram-cylinder, and as the same is revolved the spiral groove of the writing serves as the means to carry the point *d* from one end to the other of the cylinder, the trumpet swinging on its pivot *c*. No other feeding or guiding device is required.

The hard point *d* may be attached to any portion of the wall of the sounding-trumpet and yield good results. I have, however, provided a novel means of attachment that will now be described. The hard point *d* is preferably held in a socket *e*, from which it may be removed when desired. The socket is fixed on the end of a rod *f* and has position in front of the point end *g* of the trumpet. This rod extends along below the small end of the trumpet, and its end *f'* is attached to the side of the trumpet some distance back from the said point end. This manner of locating the hard point *d* and connecting it with the side wall of the trumpet, but back from its point end *g*, produces the best results.

The trumpet is made of a sheet of tough paper or thin indurated fiber, and each of the two edges of this material that come together when the sheet is folded to the cone form are first bordered by a thin sheet-metal strip folded longitudinally, as shown at *h* in Fig. 5. This metal strip incloses the sheet edge like a clip and extends from the large end to the point end. The two metal strips are abutted together and joined by solder. This metal strip not only serves as a means of joining the sheet edges, but also serves to augment and improve the sounding qualities of the trumpet.

It is a feature of improvement in this invention to attach the end *f'* of the rod to which the hard point is secured to the said metal joint-strips *h*. Thereby the metal strips become the conductor for the sound vibrations, which latter are evenly distributed all along the wall of the trumpet. The pivot-hole *c'*, heretofore referred to, is through this metal strip.

The phonogram-cylinder I is held in position by two bearings *j j'* and a horizontal axis *k*. The bearings are slotted out instead of being bored, so that the phonogram-cylinder can easily be lifted out of these bearings. The slots *l l'* in the two bearings are cut at right angles to one another and are in such a position that the force of elasticity of an

india-rubber belt *m*, connecting the pulley *n*, attached to the phonogram-cylinder, with the pulley *o* of the driving device, will keep the axis of the phonogram-cylinder always pressed firmly in the bearings, and thus produce a steady movement. By this simple means I have found that articulate speech, songs, and instrumental or other music may be reproduced from sound-writing very accurately and with great loudness, clearness, and distinctness.

It will be seen that this graphophone has a cylinder that may be rotated by any driving mechanism and a sounding-trumpet whose point end is movable along the cylinder, following the sound-writing. The point end automatically follows the spiral groove of the sound-writing, and the vibrations are transmitted to the trumpet, which generates and largely increases the volume of sound.

As the hard point *d* is held in a socket, it may be removed when worn and a new one inserted.

An adjustable cushion *p* is shown in Figs. 3 and 6, as a ring, and is mounted on the rod *f* and may be shifted along said rod. This cushion bears on the wall of the trumpet, and its varying position alters the tone or pitch of the sound.

A cylinder is shown carrying the sound-writing; but it is obvious a disk may be used instead or any shaped body to rotate.

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

1. A graphophone having in combination a rotating sound-writing; a vibratory cone-shaped sounding-trumpet pivoted to allow its point end a free swinging movement, and also a slight vertical movement; a hard point engaging the surface of the said sound-writing in front of and in line with the point end of the trumpet but not contacting therewith and supported by a rod which extends along the outer wall of the trumpet and attached to the side thereof.

2. A sounding-trumpet for graphophones comprising a sheet of fiber folded to form a cone and the edges which come together bordered by strips of metal folded over the edges and the said metal strips united, and a hard point at the point end of the trumpet.

3. A sounding-trumpet for graphophones having a cone shape and made of fiber; a strip of thin metal extending longitudinally of said cone and secured to the trumpet; a hard point in front of the trumpet's point end but not attached thereto; and a rod supporting the said hard point and extending along the outside of the trumpet and attached to said metal strip.

4. A graphophone having a base provided with two bearings each having a slot inclining in a different direction from the other; a rotary cylinder carrying the sound-writing and having journals resting in said slotted bearings; a pulley on one journal; a drive-pulley; and a belt from the drive-pulley to the cylinder-pulley, as and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

GEORGE L. HOGAN.

Witnesses:
GEORGE KOETHER,
CHARLES B. MANN, Jr.