

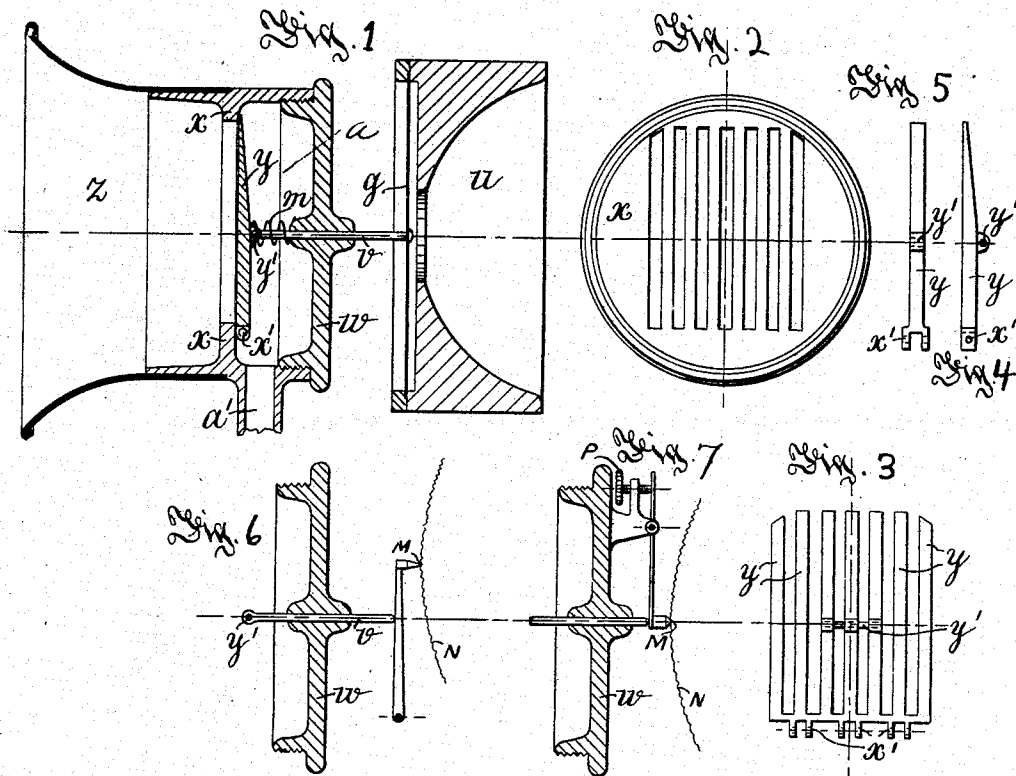
No. 677,476.

Patented July 2, 1901.

H. L. SHORT.
SOUND INCREASING DEVICE.

(Application filed Apr. 29, 1899.)

(No Model.)



Witnesses:
Ella L. Giles
O. Munn

Inventor:
Horace Leonard Short
By Richard R. [Signature]
ATTORNEYS

UNITED STATES PATENT OFFICE.

HORACE LENOARD SHORT, OF NEW MALDEN, ENGLAND.

SOUND-INCREASING DEVICE.

SPECIFICATION forming part of Letters Patent No. 677,476, dated July 2, 1901.

Application filed April 29, 1899. Serial No. 715,075. (No model.)

To all whom it may concern:

Be it known that I, HORACE LENOARD SHORT, a subject of the Queen of Great Britain, residing at New Malden, in the county of Surrey, England, have invented certain new and useful Improvements in Sound-Increasing Devices; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to articulate messages or other sounds produced by the vibrations of diaphragms in telephones, telephonic instruments, or the like or produced by mechanical means by phonographic instruments; and it has for its object improvements in the method of reproducing and increasing the volume and audibility of such sounds, so that they can be much more readily heard than is ordinarily the case and can be made audible at long distances. My improved means of so increasing the sounds obtained by instruments of the kind described or of the like kinds relate more particularly to improvements in the known devices more or less analogous to the "relays" ordinarily used in the transmission of electric-telegraph messages to long distances. In such devices the vibrating diaphragm of a telephone receiving instrument or the "style" or point which presses upon the cylinder (or disk) of a phonograph is made to cause or influence corresponding vibrations or interruptions in a column or body of air, these interruptions being reproduced upon a largely-magnified scale from and by the governing vibrations of the telephone-diaphragm or of the phonographic point, the sounds produced being directed in any desired direction by means of a trumpet-shaped or other apparatus, through which they are delivered and dispersed.

In the drawings, Figure 1 is a central sectional view of my invention. Fig. 2 is a front view of part of Fig. 1. Fig. 3 is a detail view relating to Fig. 1. Figs. 4 and 5 represent further detail views. Fig. 6 is a detail sectional view of a modified portion of Fig. 1. Fig. 7 is a similar view of a modification of Fig. 5.

In Fig. 1 the voice is used to speak into a mouthpiece *u* and set in corresponding vi-

bration the telephonic diaphragm *g*. The diaphragm *g* is shown connected with a spindle *v*, which passes through the cap *w*, fitted upon the end of the chamber *a*, of suitable diameter, into which air under sufficient pressure is forced through the pipe *a'*. Across the chamber *a* is a rigid diaphragm or partition *x*, having a series of parallel slits through it, forming a grating, as shown in front view in Fig. 2. To the partition *x* is hinged at *x'* a plate consisting of a series of light tongues or strips *y* of such size as just to close the holes forming the grating in *x*. This plate of tongues is connected at *y'* to the spindle *v*, operated by the diaphragm *g* of the telephone when the latter is spoken to, and the vibrations of the diaphragm *g* are therefore transmitted to the tongues *y*, which open and more or less close the passages through the grating *x* at a speed and in a manner exactly corresponding with the movements or vibrations of the diaphragm *g* and cause corresponding undulations in the column of air which is forced in at *a'* and is discharged through the trumpet-mouthed pipe *z*, the words or other sounds uttered into the telephone at *u* being reproduced, very greatly magnified and strengthened, and capable of being heard at a great distance by the more or less complete closing at very rapid intervals of the apertures or grating through which the air is forced. This form of apparatus is especially adapted to be used where the loud sounds to be produced are obtained by the undulations of the column of air forced through the valve, as shown. A spring *m* assists in bringing back the tongues.

In Fig. 6 the same apparatus is shown partly broken off, but operated by movements of the style or point *M* of a phonograph upon a properly-indented cylinder *N* or disk.

Fig. 7 shows a regulating-screw *P*, by which the pressure on the spindle between the valve *y* and the phonograph-cylinder *N* can be exactly adjusted and regulated.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. An apparatus for increasing the sound for telephones, phonographs and a similar instrument having a part adapted to vibrate in accordance with sound-waves comprising a valve for controlling the passage of a fluid-

current, said valve consisting of a plate provided with slits and movable tongues for controlling said slits and a connection leading from said valve to the said vibrating part, substantially as described.

2. In combination, the valve-box having air inlet and discharge portions, a grating of parallel bars in said chamber forming a valve-seat, a hinged grating of corresponding bars

forming a valve, and means for vibrating to said valve, substantially as described.

In testimony whereof I have hereunto affixed my signature in presence of two witnesses.

HORACE LENOARD SHORT.

Witnesses:

ARTHUR E. EDWARDS,
H. E. SYKES.