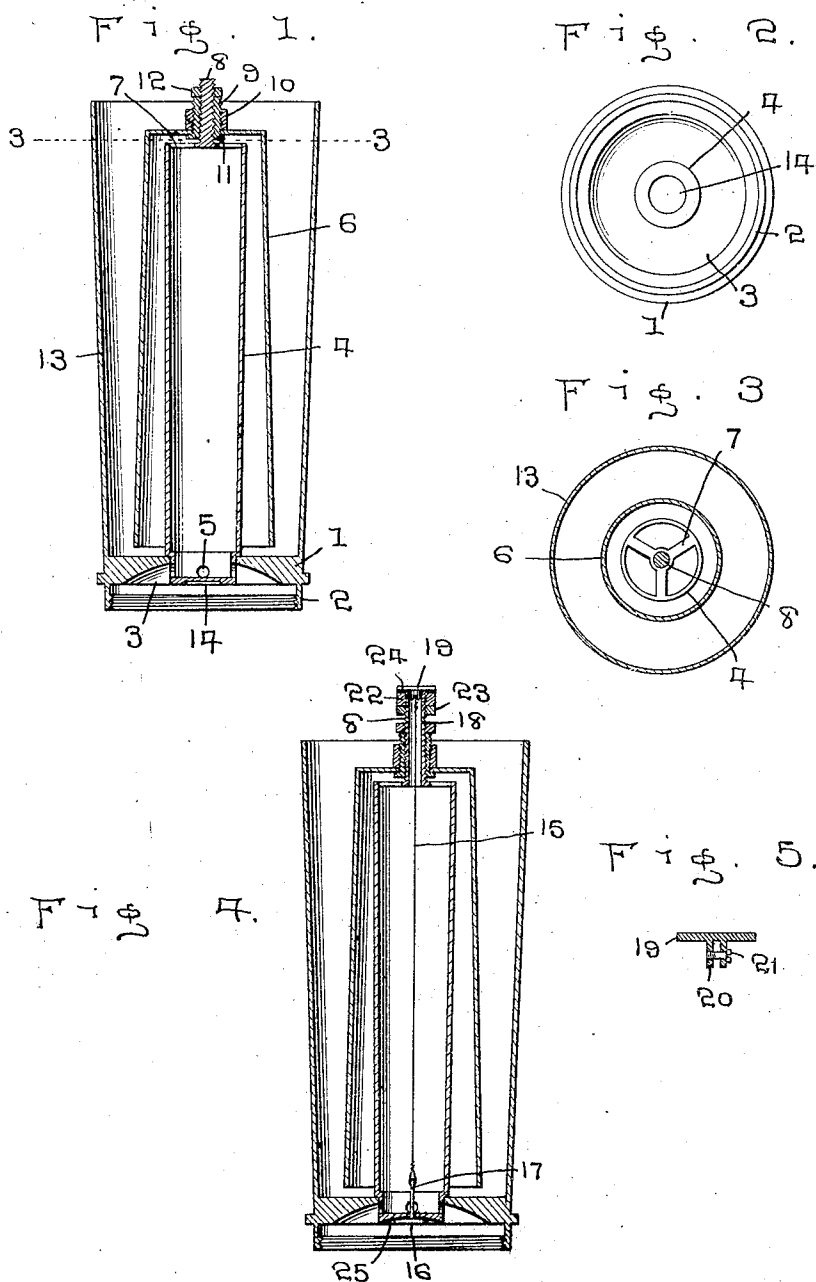


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SOUND REPRODUCER FOR TALKING MACHINES, TELEPHONES, &c.
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1,015,622.

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WILLIAM N. HUNTER, OF BLANCHESTER, OHIO.

SOUND-REPRODUCER FOR TALKING-MACHINES, TELEPHONES, &c.

1,015,622.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM N. HUNTER, a citizen of the United States, residing at Blanchester, in the county of Clinton and State of Ohio, have invented certain new and useful Improvements in Sound-Reproducers for Talking-Machines, Telephones, &c.; 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 new and useful improvements in sound reproducers for talking machines, telephones, etc., and is more particularly an improvement over my former Patent #875,352, issued December 31, 1907 and my object is to provide means in connection with a sound receiving chamber for suppressing or eliminating all sounds other than the pure and finer tones produced by the diaphragm.

A further object is to provide means for intensifying the tone sound without affecting the quality of the tone.

A further object is to provide adjustable means for increasing or decreasing the intensity of the sound.

A further object is to provide means for preventing outside disturbances or noises from reaching the diaphragm, when the diaphragm is in use for reproducing purposes, and, a further object is to provide means for adjusting the tension on the sound excluding or arresting mechanism.

Other objects and advantages will be hereinafter referred to and more particularly pointed out in the specification hereunto annexed.

In the accompanying drawings which are made a part of this application, Figure 1 is a vertical central sectional view through the device removed from the diaphragm. Fig. 2 is a bottom plan view thereof. Fig. 3 is a sectional view as seen on line 3-3 Fig. 1. Fig. 4 is a sectional view similar to Fig. 1, showing a slightly modified form of device, and, Fig. 5 is a detail sectional view of a disk used in connection with the device shown in Fig. 4.

Referring to the drawings in which similar reference numerals designate corresponding parts throughout the several views, 1 indicates a cap, which is constructed in the usual or any preferred manner, the flange 2 thereon being adapted to receive

the usual or any preferred form of diaphragm (not shown) and in the under face of the cap 1 is formed a cavity 3, which cavity is preferably dome-shaped and is adapted to gather the sound produced by the needle of the diaphragm. It is customary in devices of this class to place the cap immediately back of the diaphragm and convey the sounds through a central opening in the cap and directly into a horn or other device, but when so doing, the mechanical sounds of the machine are fully reproduced and rendered audible, thus destroying the finer tones or sounds. To overcome this objectionable feature, I provide means for eliminating all tones save the finer sound vibrations by introducing centrally through the cap 1, a tube or similar device 4, the inner end of which is extended through the cap to a point adjacent the diaphragm, when the cap is properly connected with the diaphragm. The inner end of the tube is closed and in order to admit the sound waves into the tube, that portion of the wall of the tube projecting through the cap is provided with openings 5, preferably four in number, but if preferred, a greater or less number of the openings may be provided or an elongated slot substituted for the openings. The opposite end of the tube 4 is extended a distance from the cap and is left open, so that the sound waves may escape therefrom and in order to increase the volume of the tone, a bell 6 is introduced over the tube 4, so as to carry the sound waves back to a point adjacent the cap 1, before they are released into the horn or other device for receiving the same.

The tube 4 and bell 6 are preferably tapered outwardly from their closed ends, so that the sound vibrations will more readily pass through the same and as the closed end of the bell is opposed to the open end of the tube, the flares of the tube and bell will be in opposition to each other. In order to regulate the volume of sound through the tube and bell, said bell is adjustably mounted with respect to the tube by extending a spider 7 across the open end of the tube and extending upwardly from the center thereof is a stud 8, which is exteriorly threaded and around said stud is introduced a sleeve 9, which is interiorly and exteriorly threaded, the interior threads engaging the threads of the stud, while the exterior threads are engaged by a nut 10, and

by means of which the bell is locked in engagement with the sleeve. The lower end of the sleeve is provided with a peripheral flange 11, upon which the bell rests, said flange fitting within the bell, while the nut 10 is placed on the opposite side of the bell, thereby locking the closed end of the bell between the flange and nut, when the nut is turned home on the sleeve. When increasing the volume of sound, the sleeve 9 is turned outwardly on the stud 8 and vice versa when the volume of sound is reduced, a locking nut 12 being introduced on to the free end of the stud, so that when the locking nut is turned against the end of the sleeve, said sleeve will be held in its adjusted position on the stud.

The cap 1 has attached thereto an elongated band 13, which is preferably formed integral with the cap, although the same may be formed separable, if desired. This band is arranged to receive the end of the usual form of horn or other device and is preferably flared from its inner to its outer end and as communication with the outside atmosphere is completely closed at the point of intersection of the band with the cap, the sound produced by the diaphragm will be greatly intensified when it reaches the horn.

In practice, it has been found that the finer tones are produced at a point farthest from the center of the diaphragm and in order to eliminate the harsh sounds produced by the needle at the center of the diaphragm, the closed end of the tube 4 is provided with a recess 14 and as said recess is immediately above the needle, the usual scratching or other sounds produced by the needle will be delayed by the recess, and reflected from the walls thereof to be commingled with and somewhat smothered by the more perfect and mellow tones which are passed through the openings in the tube and emitted from the horn attached thereto. The atmospheric pressure produced by the volume of air collected in the recess 14 will also serve to modify the vibration of the diaphragm and maintain a uniform vibration thereof.

As best shown in Fig. 4, I have also provided a slightly modified form of device which consists of extending a wire 15 lengthwise of the tube 4, the lower end of the wire being attached to a disk 16, the shank 17 of which projects through the closed end of the tube, while the opposite end of the wire enters a central opening 18, through the stud 8 and is attached to a disk 19 at the outer end of the stud. The disk 19 is provided with a pair of inwardly projecting ears 20, through which is entered a screw 21, around which the wire is attached, the outer end of the wire having a loop, 65 through which the screw extends and by

attaching the outer end of the wire in this manner, it can be readily disengaged from between the ears, should it be desired to remove the bell from the tube. In order to increase or decrease the tension of the wire, 70 a nut 22 is introduced around the stud 8 before the disk 19 is placed thereover and in addition to the nut 22, I provide a jam nut 23, the object of which is to hold the nut 22 against rotation, when said nut is properly 75 set. The end of the opening through the stud is hermetically sealed by placing between the nut 22 and disk 19 a gasket or the like 24, which is preferably constructed of rubber, while a similar gasket 25 is placed 80 between the disk 16 and end of the tube 4. The wire 15, when drawn reasonably tight, is adapted to be vibrated by and to a certain degree absorb the harsher and higher 85 toned sounds. This action somewhat tones down the tube 4 and allows the softer sound waves to pass therethrough almost unmolested. In this instance, the face of the end section of the tube is formed concave, which serves to hold the sound waves produced at the center of the diaphragm. The 90 gaskets 24 and 25 also prevent the sound waves from passing into the parts to which the wire is attached, thus eliminating any effect that an outside noise or jar might 95 otherwise have upon the diaphragm. By this construction, it will be readily seen that none but the finer tones will be reproduced and that the intensity of the sound may be readily increased or decreased, as occasion 100 may require. It will further be seen that in view of the simplicity of this device, it can be very cheaply constructed and can be readily attached and operated in connection with any form of sound producing device 105 and it will likewise be seen that by placing the wire through the tube in the manner shown, any outside influences will be excluded from the diaphragm. It will also be understood that although I have shown 110 but one wire, any number of wires may be used, as occasion may require.

What I claim is:—

1. In a sound reproducer, the combination with a cap, of a hollow member having one 115 of its ends extended through the cap, said end being closed and the opposite end open, an additional hollow member extending over the first hollow member, means to adjust the second hollow member, the first 120 hollow member having openings therein to admit sound from the cap and the closed end of said first hollow member having a recess therein.

2. In a sound reproducer, the combination 125 with a cap, of a hollow member projecting through said cap, one end of the hollow member being closed and a stud at the opposite end thereof, a wire extending through the hollow member and stud, disks for se- 130

curing the ends of said wire in said hollow member, and means at the end of the stud to increase or decrease the tension of the wire.

5 3. In a sound reproducer, the combination with a hollow member having one of its ends closed and a stud at the opposite end of the hollow member, of a wire extending longitudinally through the hollow member and through the stud, a disk at each end of the wire to anchor said ends and means surrounding the stud adapted to direct pressure against one of the disks and regulate the tension of the wire.

10 4. In a sound reproducer, the combination with a hollow member having a closed end

and a stud at its opposite end, of a wire extending through the hollow member and through said stud, a disk at each end of the wire, to which the wire is secured, means to 20 increase the tension of the wire and gaskets between the disks and parts with which they engage to prevent the vibration of the wire affecting said parts.

In testimony whereof I have signed my 25 name to this specification in the presence of two subscribing witnesses.

WILLIAM N. HUNTER.

Witnesses.

A. J. SAVAGE,

JOHN A. KELLY.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."