A. N. PIERMAN.

SOUND MODIFIER.

APPLICATION FILED SEPT. 13, 1906.

917,654. Patented Apr. 6, 1909.

Fig. 1

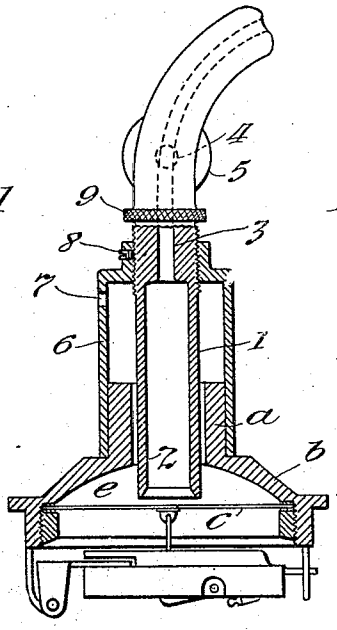


Fig. 2

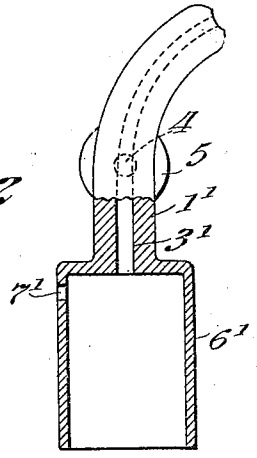
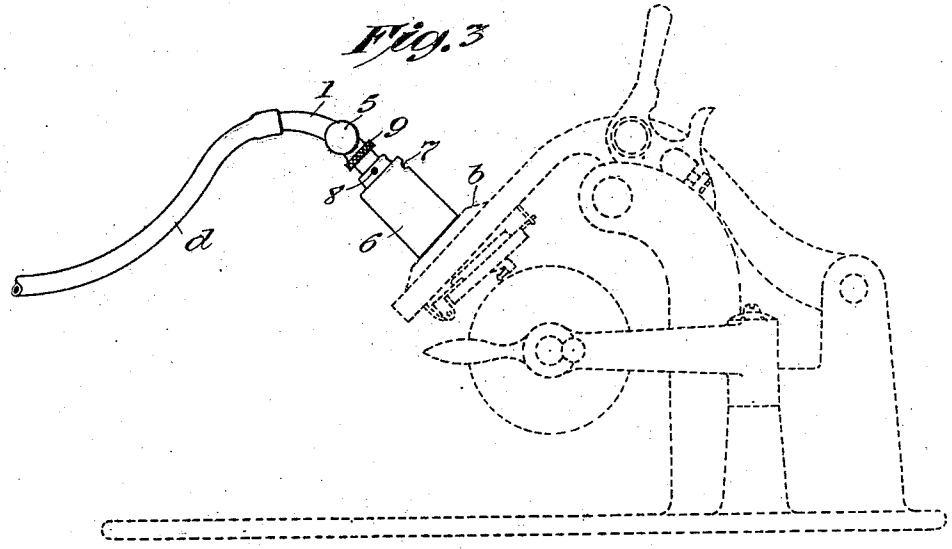


Fig. 3



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UNITED STATES PATENT OFFICE.

ALEXANDER N. PIERMAN, OF NEWARK, NEW JERSEY, ASSIGNOR TO NEW JERSEY PATENT COMPANY, OF WEST ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

SOUND-MODIFIER.

No. 917,654. Specification of Letters Patent. Patented April 6, 1909.

Application filed September 13, 1906. Serial No. 334,441.

To all whom it may concern:

Be it known that I, ALEXANDER N. PIERMAN, a citizen of the United States, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Sound-Modifiers, of which the following is a description.

My invention has for its object the provision of means for eliminating harsh or disagreeable sounds which sometimes accompany phonographic reproduction and which are particularly unpleasant when the sounds are received by the hearer through ear tubes, as for example, in the ordinary use of the phonograph for commercial purposes. It appears that the tones which are produced by the central portion of the diaphragm of the reproducer are purer in quality and freer from vibrations which produce the harsh sounds above referred to, than those which emanate from other portions of the diaphragm, and it is therefore my object more particularly to provide means whereby the vibrations from the center of the diaphragm are transmitted to the hearer while the vibrations from other portions of the diaphragm are largely if not entirely eliminated.

My invention also includes means for varying or regulating the strength or volume of the sounds produced whereby an adjustment may be secured to adapt the reproduction to the ear of any particular listener.

With these ends in view my invention consists in the features hereinafter described and claimed.

Reference is hereby made to the accompanying drawing of which—

Figure 1 is a side elevation, partly in axial section, of a phonograph reproducer with one form of my invention applied thereto; Fig. 2 is a side elevation, partly in section, of a modification of my invention; Fig. 3 is a side elevation showing in dotted lines a phonograph of the Edison Commercial type with the device of Fig. 1 applied thereto and provided with a flexible ear tube.

In all views corresponding parts are designated by the same reference numerals.

The improved sound modifier comprises preferably a tube 1 of a diameter sufficiently small to enable it to pass through the neck *a* of the phonograph reproducer *b*, with sufficient clearance, as shown in Fig. 1, to permit the free passage of sound waves around the same. The lower end of the tube 1 should preferably extend close to the central portion of the diaphragm *c* and such end may be chamfered as shown in order to somewhat increase the area of the opening of the bore 2. The upper end of the tube 1 is provided with a bore 3 of smaller diameter than the bore 2 and communicating therewith. Threaded across the bore 3 so as to form a valve for regulating the area through which the sound waves must pass to the listener, is a screw 4 having a head 5 by which it may be readily turned by the user. The upper end of the tube 1 is preferably curved forward as shown for convenience in attaching the flexible listening tube *d*. The tube 1 may be supported in its operative position by any suitable means, preferably means which will allow the same to be readily applied to and disengaged from the phonograph reproducer. The means shown consists of a cup shaped member 6 of such size as to fit snugly upon the neck *a* of the reproducer *b*. The cup 6 is provided with an aperture 7 to permit the escape of sound waves which pass from the resonating chamber *e* around the tube 1 to the interior of the cup 6, or at any rate to prevent acoustic distrubances which might exist in case the chamber of the cup 6 were without an outlet.

In order to provide an adjustment whereby the tube 1 may be secured in proper relation to the diaphragm *c* in reproducers of somewhat different form, the tube 1 is threaded within the upper end of the cup 6 as shown, being held in any desired position by set screw 8, and the tube 1 may be provided with a milled collar 9 to enable the same to be readily turned when it is desired to adjust the same.

In operating the device, the operator merely applies the same to the phonographic reproducer by passing the tube 1 through the neck *a* so that the lower edge of the cup 6 rests upon the body of the reproducer. The tube 1 may then be adjusted if it is considered desirable with respect to the cup 6, so as to bring the lower end of the tube 1 to the most desirable distance from the diaphragm *c*, said tube being then secured by the set screw 8. The ear tube 6 is

then applied to the end of the tube 1 and the volume of sound regulated by the screw 4.

In the device of Fig. 2 a cup 6′ is provided with an opening 7′ and is adapted to fit upon the neck *a* of the reproducer in the same way as the cup 6 previously described. The upper end of the cup 6′ is provided with an extension 1′ having a bore 3′ which communicates with the interior of the cup 6′. The screw 4 having a head 5 is threaded across the bore 3′ so as to act as a regulating valve. In this form of device the elimination of objectionable sounds takes place to a considerable extent on account of the opening 7′ allowing the escape thereof, although not to so great an extent as in the use of the device of Fig. 1.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is as follows:

1. A phonograph reproducer comprising a hollow body and a tubular neck leading to the interior thereof, and a tube passing through said neck, said neck having a passage from the interior of said body to the atmosphere exteriorly of said tube, substantially as set forth.

2. As a new article of manufacture, a sound modifier comprising a tube of a diameter sufficiently small to permit it to pass through the neck of a phonograph reproducer, and a supporting cup adapted to telescope upon said neck, substantially as set forth.

3. As a new article of manufacture, a sound modifier comprising a tube of a diameter sufficiently small to permit it to pass through the neck of a phonograph reproducer, and a supporting cup adapted to telescope upon said neck, said cup having an opening extending through the body thereof, substantially as set forth.

4. As a new article of manufacture, a sound modifier comprising a tube and a support adjustably applied directly to the exterior thereof, substantially as set forth.

5. As a new article of manufacture, a sound modifier comprising a tube and a support threaded upon the said tube, substantially as set forth.

6. A sound modifier comprising a tube and a hollow cylindrical support concentric therewith and secured directly thereto, substantially as set forth.

7. A sound modifier comprising a tube and an apertured cup concentrically secured thereto, substantially as set forth.

8. A sound modifier comprising a tube and a cup threaded on the exterior thereof, substantially as set forth.

9. In a phonograph, the combination of a diaphragm and diaphragm support comprising a resonating chamber, and a sound conveying tube extending through said resonating chamber into proximity with the diaphragm, said resonating chamber communicating with the atmosphere by an opening or passage exterior to the said tube, substantially as set forth.

10. A sound modifier comprising a cup adapted to be applied to a phonograph reproducer and having an aperture through the body thereof and a tube having a bore for conducting the sound waves and carried by said cup, substantially as set forth.

11. A sound modifier comprising a tube having a sound conducting bore, a valve for regulating the extent of opening of said bore, and a cup supporting said tube and adapted to be applied to a phonograph reproducer, said cup having an aperture through the body thereof, substantially as set forth.

12. A phonograph reproducer comprising a hollow body and a tubular neck leading to the interior thereof, a diaphragm, and a tube passing through said neck into proximity to the central portion of the diaphragm, said neck having a passage from the interior of said body to the atmosphere exteriorly of said tube, substantially as set forth.

13. A sound box comprising rear and side walls, a diaphragm therein, a sound box tube projecting from said rear wall, a sound modifying tube movable within said sound box tube and means for adjusting said sound box tube into and out of close proximity to said diaphragm, substantially as set forth.

14. A sound box comprising rear and side walls, a diaphragm therein, a sound box tube projecting from said rear wall and a sound modifying tube movable within said sound box tube, and means exterior to said sound box for adjusting said sound modifying tube into and out of close proximity to said diaphragm, substantially as set forth.

15. A sound box comprising side walls and a rear wall having an opening therein, a diaphragm in said sound box, a sound box tube projecting from said rear wall and surrounding said opening, a sound modifying tube movable within said sound box tube and extending through the opening in the rear wall of the sound box and means for adjusting the sound modifying tube into and out of proximity to the diaphragm.

This specification signed and witnessed this 10th day of September 1906.

ALEXANDER N. PIERMAN.

Witnesses:
DELOS HOLDEN,
MARY J. LAIDLAW.