No. 871,000. PATENTED NOV. 12, 1907.

C. A. SMITH.

SOUND REPRODUCING HEAD.

APPLICATION FILED FEB. 28, 1906.

2 SHEETS—SHEET 1.

Fig. 1.

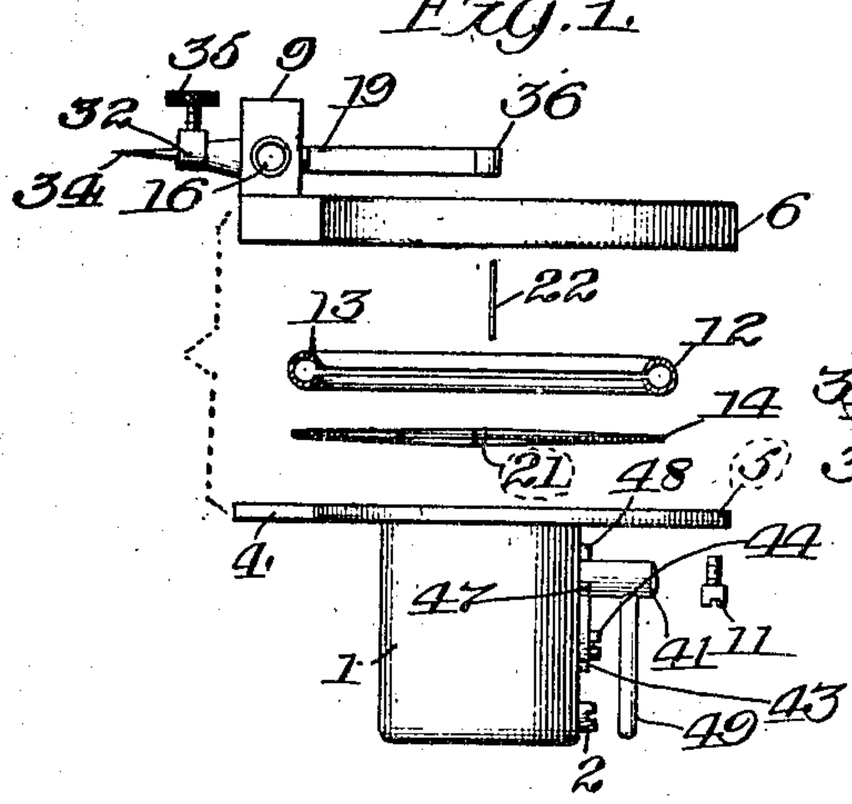


Fig. 3.

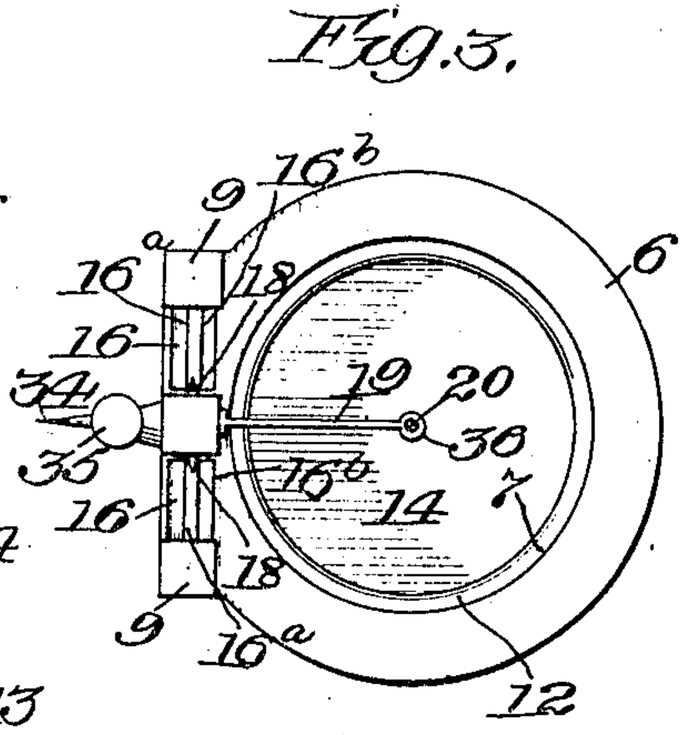


Fig. 2.

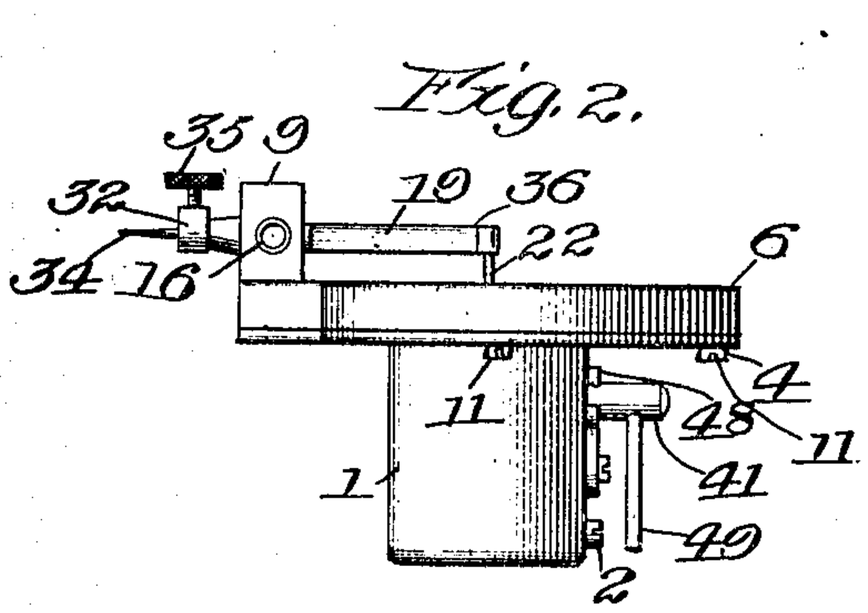


Fig. 5.

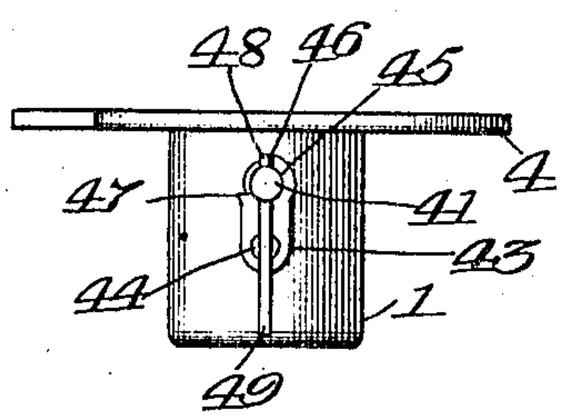
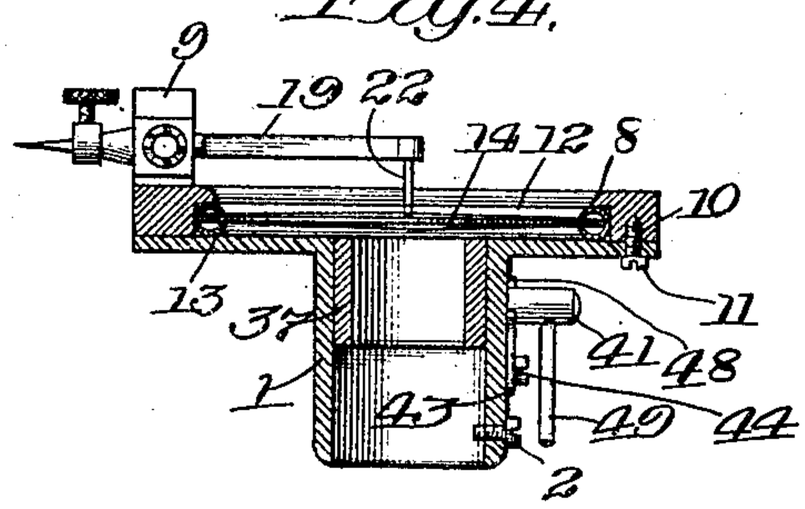


Fig. 4.



Witnesses:
C. W. Yeomans
E. M. Patterson,

Inventor:
Curtis A. Smith
by Benj. T. Rowland
Atty

No. 871,000. PATENTED NOV. 12, 1907.

C. A. SMITH.

SOUND REPRODUCING HEAD.

APPLICATION FILED FEB. 28, 1906.

2 SHEETS—SHEET 2.

Fig. 10.

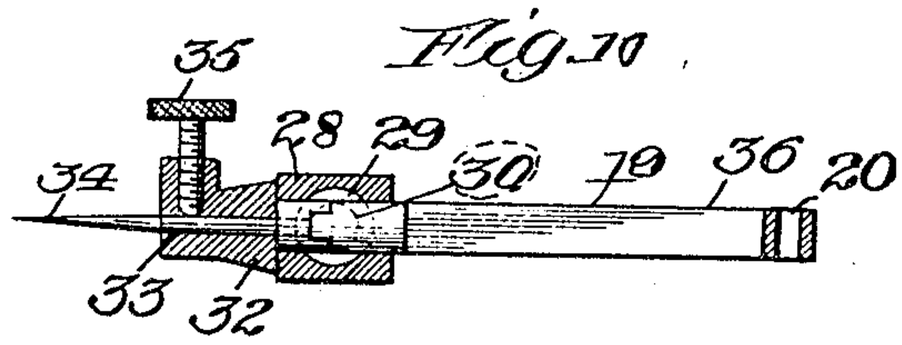


Fig. 11.

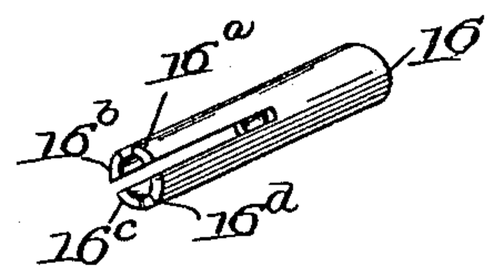


Fig. 6.

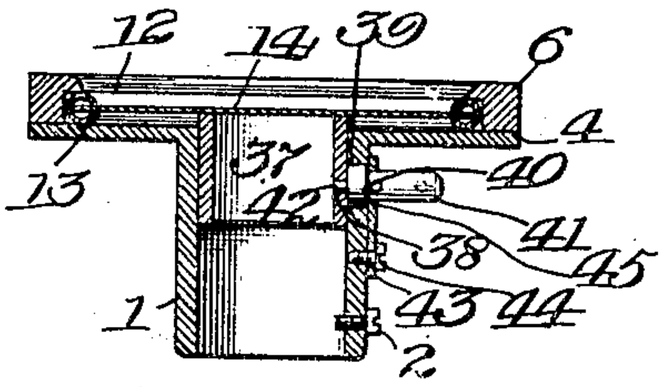


Fig. 8

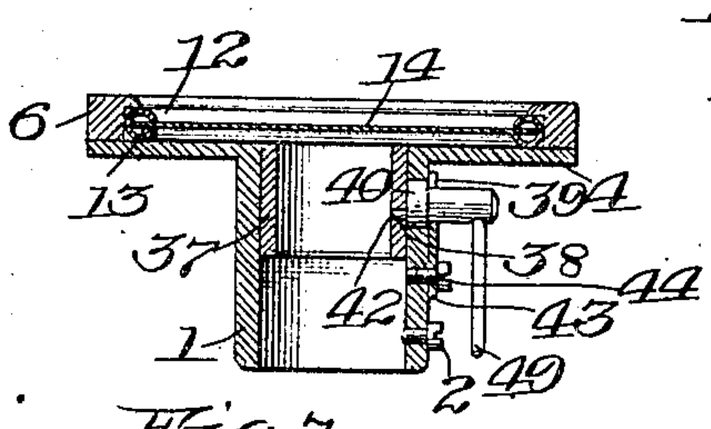


Fig. 12.

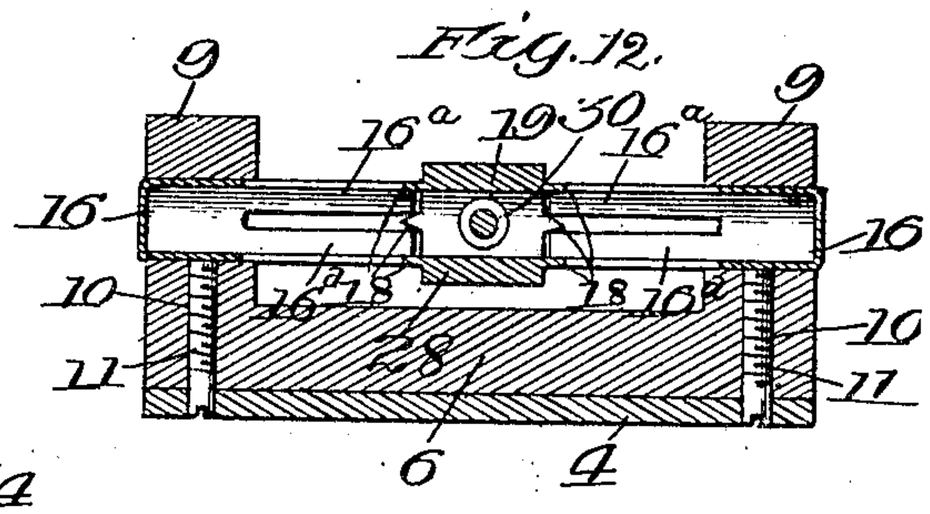


Fig. 7.

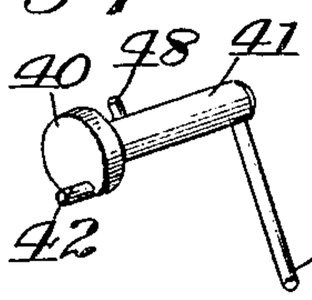
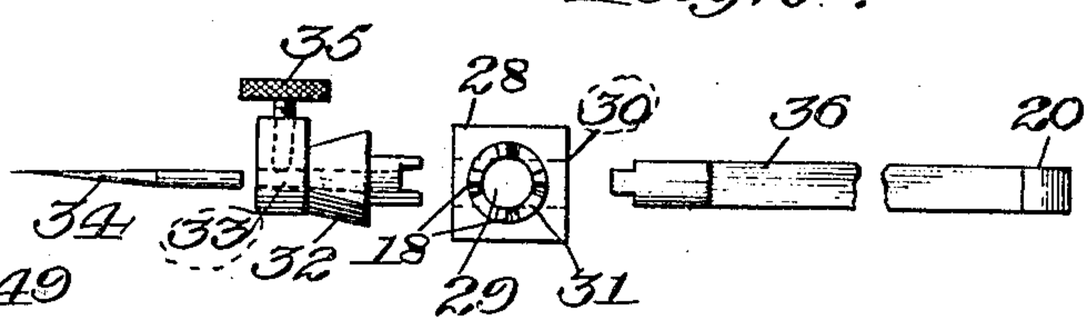


Fig. 9.



Witnesses:
Otto Klemick
E. M. Patterson

Inventor:
Curtis A. Smith.

by Benj. T. Rowland
Atty

UNITED STATES PATENT OFFICE.

CURTIS A. SMITH, OF ELGIN, ILLINOIS.

SOUND-REPRODUCING HEAD.

No. 871,000. Specification of Letters Patent. Patented Nov. 12, 1907.

Application filed February 28, 1906. Serial No. 303,393.

To all whom it may concern:

Be it known that I, CURTIS A. SMITH, a citizen of the United States, residing at Elgin, in the county of Kane and State of Illinois, have invented certain new and useful Improvements in Sound-Reproducing Heads, of which the following is a specification.

My present invention relates to improvements in sound reproducing heads for sound reproducing machines, and has for its object the production of a head wherein there are means for controlling the volume of sound delivered to the audience.

A further object of my invention is the production of a simplified means for providing a fulcrum for said stylus arm.

To the attainment of these various objects my invention consists of the new and novel structure and combination of parts as will presently appear.

In the drawings:—Figure 1 is a side elevation of the various parts of my sound head separated but in position for assembly. Fig. 2 is an elevation of the assembled sound head. Fig. 3 is a top plan view of my sound head. Fig. 4 is a sectional view of the assembled sound head, taken on line X X of Fig. 3. Figs. 5, 6, 7 and 8 are detail views showing the construction of my new muting device. Fig. 9 shows the various parts going into the construction of my new lever or stylus arm. Fig. 10 is a sectional view showing the various parts in Fig. 9 assembled to form the stylus arm or lever. Fig. 11 is an enlarged perspective view of one of the members forming the bearing or fulcrum for the stylus arm or lever. Fig. 12 is a vertical sectional view through the stylus arm and its bearing assembled with the head.

The numeral 1 designates the collar which fits snugly over the sound conduit of a sound reproducing machine.

2 designates a stop which serves to secure the proper positioning of the sound head upon the sound conduit.

The numeral 4 designates a plate integral with the collar 1 which forms the back of my reproducing head. Through the plate 4 are the screw holes 5.

The numerals 6 designate the top plate of my sound head, and is provided with the round central aperture 7, the annular shoulder 8, the posts or pillars 9, and the screw holes 10 by means of which through the agency of the screws 11 it is attached to the plate 4. Between the plates 4 and 6 and contiguous with the annular shoulder 8 is mounted the split tube 12, the split therein being designated by the numeral 13. Extending into the tube 12 through the split 13 is mounted the diaphragm 14.

In the holes 15 in the pillars 9 are mounted the pieces 16, which I prefer to make of hollow tubes, the inner ends of which are split at right angles to form the fingers 16^a, 16^b, 16^c, and 16^d, the ends of which said fingers, as shown in Fig. 11 at 17, engage the faces of the triangular projection 18 of the stylus arm or lever 19.

The inner end 36 of the stylus arm or lever 19 is perforated, as shown at 20 in Figs. 9 and 10. A like perforation 21 is provided in the center of the diaphragm. The ends of the piece 22, which I make of a flexible fiber, are inserted into the perforations 20 and 21, and properly secured with wax, cement, or other appropriate means, thus binding the diaphragm 14 and the stylus arm 19 firmly together.

When a proper adjustment is secured between the stylus arm 19 and the diaphragm 14, and between the stylus arm and the pieces 16, the said pieces 16 are secured and maintained in their proper position by means of the screws 11 working in the holes 10 as clearly shown in Fig. 12.

My new stylus arm or lever 19 consists of the hub 28 which I make in the form of a cube. Through the hub 28 and at right angles to each other I provide the holes 29 and 30. Into the hole 29 is inserted the tube 31 whose ends are each provided with the four triangular projections 18, the faces of which contact with and engage the fingers 16^a, 16^b, 16^c and 16^d. In one end of the hole 30 is introduced the piece 32 which is provided upon its outer end with the chamber 33 for the reception of the stylus 34, and the milled headed screw 35 for securely clamping the stylus in its chamber. In the other end of the hole 30 is introduced the inner end 36 of the stylus arm. When the parts are assembled as above described, they can be readily sweated together with a little solder. The parts as above described can all be made with automatic machinery, thereby permitting of a considerable economy in manufacture.

My improved muting device is constructed as follows: In the collar 1 is slidingly mounted the hollow cylinder 37 having in its wall the conical aperture 38. Adjacent to the aperture 38 in the wall of the collar 1 is provided the cylindrical aperture 39. In the aperture 39 is mounted the short shaft 40, having the diminished end 41 projecting beyond the outer surface of the collar 1. On the inner end of the shaft 40, to one side of the center or eccentrically, is mounted the stud 42 which engages with the aperture 38 in the cylinder 37. It is obvious that by revolving the shaft 40, the eccentrically mounted stud 42 working in its aperture or bearing 38 will force the cylinder 37 forward and backward in the collar 1. The hollow cylinder 37 is so positioned that when it is furthermost in the collar its outer edge lies flush with the inner surface of the plate 4. Any turn that is given to the shaft 40 forces the inner end of the hollow cylinder 37 nearer to the vibrating diaphragm 14, thereby shutting off the sound waves rising from the edges of the diaphragm and reducing the volume of sound delivered to the audience. For the purpose of maintaining the shaft 40 in place, I provide upon the outer surface of the collar 1 the plate 43 which is attached thereto by

means of the screw 44. The plate 43 is provided with the hole 45 of sufficient diameter to accommodate the diminished end 41 of the shaft 40. The hole 45 is further cut away to provide the shoulders 46 and 47. Upon the diminished end 41 of the shaft 40 are the stop pin 48, which works between the shoulders 46 and 47 and by means of which the revolution of the shaft 40 is limited, and the crank or pin 49 by means of which the shaft 40 is revolved.

Having described my invention, it is evident that I provide a sound head of new and extremely simple construction for the more perfect reproduction and control of sound.

What I claim as new and desire to secure by Letters Patent is:—

1. A pivotal support for a stylus arm having a member provided with a plurality of axially extending parallel spring fingers and means for engaging the ends of said member.

2. In combination with a sound reproducing head having a tube running from the diaphragm chamber, a mute consisting of a tubular body movably mounted in said tube and adapted to be moved to project into said diaphragm chamber, and means for moving and adjusting said mute at different distances from the vibrating diaphragm, said means extending through the walls of said tube and adapted to be manipulated from the exterior thereof.

3. In combination with a sound reproducing head, a mute consisting of a tube mounted in the passage for the escape of the sound, and an eccentric in engagement with said tube and operable to advance said tube towards and with draw it from the diaphragm.

4. In combination with a sound reproducing head, a mute consisting of a tube mounted in the opening for the escape of the sound, a shaft carrying an eccentric, said tube being operably connected with said eccentric and means for limiting the revolutions of the shaft.

5. In a sound reproducing head a stylus arm having angular projections, a spring fulcrum consisting of two pieces whose inner portions are split at right angles, the inner end of the divisions formed thereby contacting with and engaging the faces of said angular projections.

6. In sound heads for sound reproducing machines, pieces carried in adjustable assembly with said sound head the inner portion of said pieces being split in sections, a stylus arm and projections carried upon each side of said stylus arm for engaging said sections.

7. A support for stylus arms in sound reproducing machines, comprising a plurality of axially extending fingers, means for frictionally engaging and bending said fingers to produce tension and a stylus arm.

8. A fulcrum for stylus arms in sound reproducing machines consisting of two pieces each with a plurality of fingers to engage the stylus arm.

9. A fulcrum for stylus arms in sound reproducing machines consisting of two pieces the ends of which are divided into a plurality of fingers, means upon the stylus arm for engaging said fingers, and means for connecting said pieces with the sound head.

10. A sound box comprising rear and side walls, a diaphragm therein, a sound box tube projecting from said rear wall and a sound modifier consisting of a tube movable within said sound box tube and adjustable into and out of close proximity to said diaphragm and means carried by said sound box and exterior thereof to adjust said sound modifier.

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

CURTIS A. SMITH.

Witnesses:
BENJ. T. ROODHOUSE,
E. M. PATTERSON.