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ROTATING LOUDSPEAKER

Filed July 26, 1955

Fig. 1.

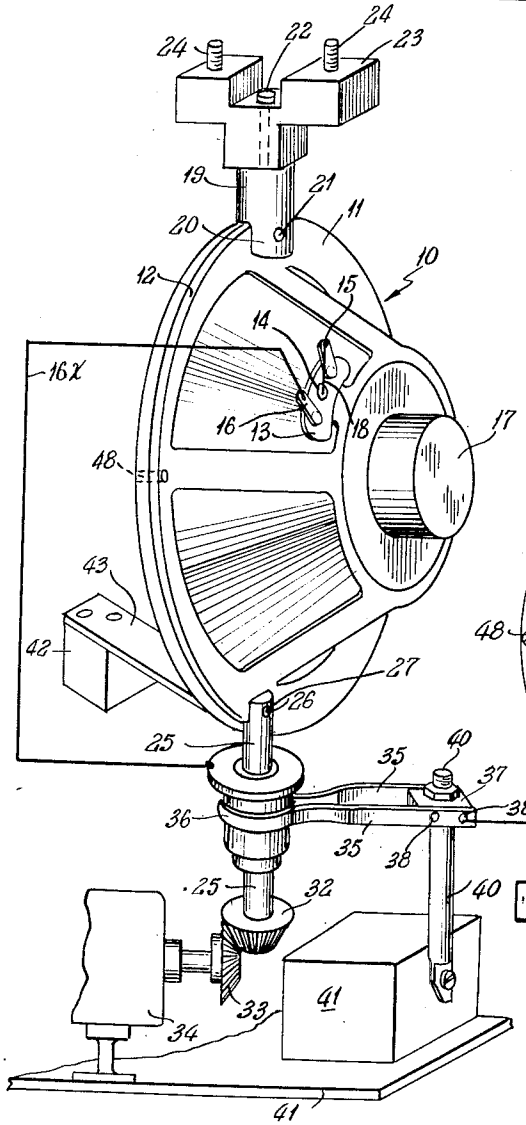


Fig. 2.

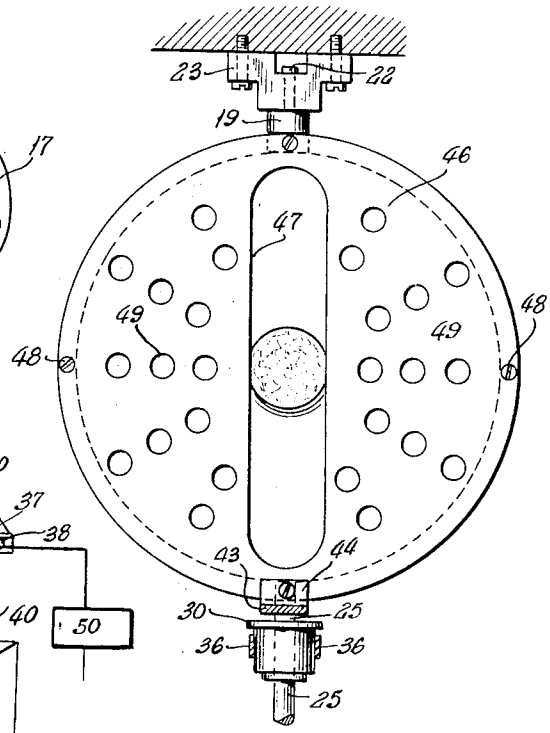


Fig. 3.

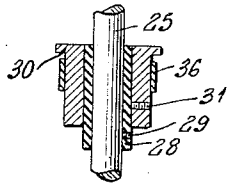
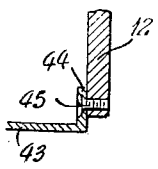


Fig. 4.



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ROTATING LOUDSPEAKER

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4 Claims. (Cl. 179—1)

This invention relates to a rotating loudspeaker and more particularly to rotating electrically actuated loudspeaker.

It is an object of this invention to provide a loudspeaker mounted on a rotatable shaft.

It is another object to provide a loudspeaker disposed in balanced relationship on a rotatable shaft.

It is a further objective to provide a loudspeaker adapted to disseminate acoustical vibrations about a rotating axis.

It is a further objective to provide a loudspeaker with a baffle plate secured to the speaker mouth.

These and other objectives of this invention will become apparent upon reading the following descriptive disclosure taken in conjunction with the drawing in which;

Fig. 1 is a perspective view of the loudspeaker showing the manner of mounting the rotatable shaft to the loudspeaker mouth,

Fig. 2 is a front view showing a baffle plate secured optionally to the rim of the loudspeaker,

Fig. 3 is a detail section view showing the manner of insulating the rotatable shaft from the rotating electrical contact sleeve, and

Fig. 4 is a detailed section view broken away to show the manner of securing the counter-weight arm to the speaker rim.

Turning to the drawing a conventional loudspeaker **10** is provided with a conventional grille **11** having a rim **12**. The speaker **10** is provided with a conventional insulating plate of plastic **13** secured to the grille **11** by a rivet **14**. The plate **13** is provided with electrical terminals **15** and **16** respectively. Terminal **15** is contacted (not shown) electrically to a conventional voice coil **17** and then is grounded to rivet **14** by wire **18** to the grille **11**.

An important feature of this invention is the securing of the rotatable element to loudspeaker.

The loudspeaker rim **12** of the grille **11** is secured to a top rod **19** having a cut-back lip **20** by means of a rivet **21**. The rod **19** is provided with a journal rod **22** of lesser diameter than rod **19**.

A stabilizer bearing block **23** is provided with an aperture to receive the journal rod **22** and with a pair of spaced-apart apertures adapted to receive bolts **24**. Bolts **24** may be secured into the ceiling or other rigid structure of a building room or the like.

The bottom of the grille **11** is secured to a bottom rod **25** having a cut-back lip **26** by means of a rivet **27**.

The bottom rod **25** is provided with an insulator tubular sleeve **28** of electrically insulating material (Fig. 3).

The sleeve **28** is securely fixed to rod **25** by means of one or more set-screws **29**. A tubular flanged top slip collar **30** is securedly disposed over the insulator sleeve **28** and secured thereto by one or more set-screws **31**. Thus ring **30** is fully insulated electrically from rotating rod **25** yet it rotates therewith.

The bottom rod **25** is provided with a bevel gear **32** adapted to bear on and mesh with bevel gear **33** secured to motor **34**.

A slip clamp, preferably bifurcated and consisting of two clamp arms **35** has each of the arms **35** provided with a curvatured palm **36** adapted to closely contact flanged slip collar **30** thereby effecting good electrical contact.

As shown in Figs. 1 and 2 the arms **35** behave in opposition to one another thereby holding the rod **25** steadily. Also the clamps **35** may help support the weight of the loudspeaker where the flange of the collar **30** rests upon the palm sections **36** of arms **35**.

In the embodiment shown the arms **35** are secured to opposing ends of a square suitably apertured insulator block **37** by means of metal bolt fasteners **38** which effect electrical contact between both arms **35**.

The insulator block **37** is also provided with a centrally disposed aperture adapted to securingly receive bolt and nut **40**. The bolt **40** is secured to a part of the rigid support frame **41** which may be suspended by conventional means from the ceiling of the auditorium in which the loudspeaker is located.

Other means of effecting a slip or running contact between collar **30** and an electrical arm **35** is to employ but one arm preferably having an aperture therein for receiving said collar **30**.

In the operation of this rotating loudspeaker, while good acoustical results were obtained, it was found that the loudspeaker was unbalanced and therefore set up deleterious vibrations. To overcome the deleterious vibrations a counter-weight **42** was secured to a metal strap **43** having an apertured end flange **44** (Fig. 4). The flange **44** may be secured directly to the grille rim **12** (Fig. 4) by means of threaded screw **45** and good balance is thereby obtained through all rotational cycles.

Preferably the speaker is operated at about 40 to 60 revolutions per minute. Higher speeds are disadvantageous to the production of pleasing acoustics. At the speeds employed preferably but optionally a baffle **46** is employed to eliminate dead sound pockets.

The baffle **46** may be made of many materials but wooden or plastic circular baffle having a vertically disposed slot **47** is preferred. The baffle **46** is secured directly to the mouth or rim **12** of the speaker by means of a plurality of screws **48**. Also the baffle is provided with a plurality of apertures **49** disposed on each side of slot **47** for the obtaining of beat acoustical results.

As shown in Fig. 1, the terminal **16** is secured electrically by wire **16X** to collar **30** and secured thereto by soldering. A wire (not shown) leads to voice coil **17**. Thus the electrical impulses pass from a conventional amplifier unit **50** into the arms **35**, thence to collar **30** and wire **16X** to terminal **16** whence the impulses are led to voice coil **17**. The ground or return wire from coil **17** leads to terminal **15** whence final grounding is effected through wire **18** to grille **11** and rod **19**.

The invention has been described broadly and by illustrative embodiments but it is not to be limited to the described embodiments.

We claim:

1. A rotatable loudspeaker for attachment to overhead structure and for disseminating sound to an audience below comprising a metal grille, a voice coil secured fixedly to said grille, a top vertical shaft secured at its bottom end fixedly to the top of said grille and having an axle at the other end, a bottom shaft secured at its top fixedly to the bottom of the grille, a removeable insulator sleeve secured to said bottom shaft, a metal slip collar removably secured to said insulator sleeve and insulated from said bottom shaft, means for rotating said bottom shaft and secured thereto, a bearing block having an aperture therein for receiving said axle of said top shaft and

adapted for securing to a ceiling support, a metal slip clamp disposed against said metal collar in sliding contact thereto, a bottom support structure for holding said loudspeaker, means for securing said metal slip clamp in insulated relationship to said loudspeaker support, electrical conduit means for securing said slip clamp to an amplifier unit, electrical conduit means for fixedly securing said collar to said voice coil, and electrical conduit means for electrically securing said voice coil to said grille, whereby electrical sound impulses travel from said amplifier to said slip clamp and thence to said collar and then to said voice coil, said voice coil having a return conduit to the grille, which grille is grounded through the top shaft and bearing block to said ceiling.

2. The apparatus of claim 1 wherein the slip clamp comprises a pair of clamp arms disposed in sliding contact opposed relationship to said collar, bolt means for electrically and mechanically securing said arms in spaced relationship, an insulator block having a central aperture and lateral apertures, said bolt means being disposed through said lateral apertures and a rod disposed through said central aperture in insulated relationship to said

bolt means for securing said insulator block to said loudspeaker support.

3. The apparatus of claim 2 having a non-metallic baffle secured to said grille, said baffle having a vertically disposed slot and further having a plurality of circular apertures disposed on each side of said vertical slot whereby dead sound pockets are eliminated during the rotation of said loudspeaker grille and the voice coil therein.

4. The apparatus of claim 3 comprising a weight bracket arm secured to the base of the grille and extending away from the voice coil, and a counterweight secured to the extending end of said weight bracket whereby the weight of the grille and voice coil extending beyond the plane of the grille face is compensated thereby eliminating undesireable vibrations in the grille.

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