May 6, 1930. A. A. KENT 1,757,719

LOUD SPEAKER MOUNTING

Filed April 23, 1929

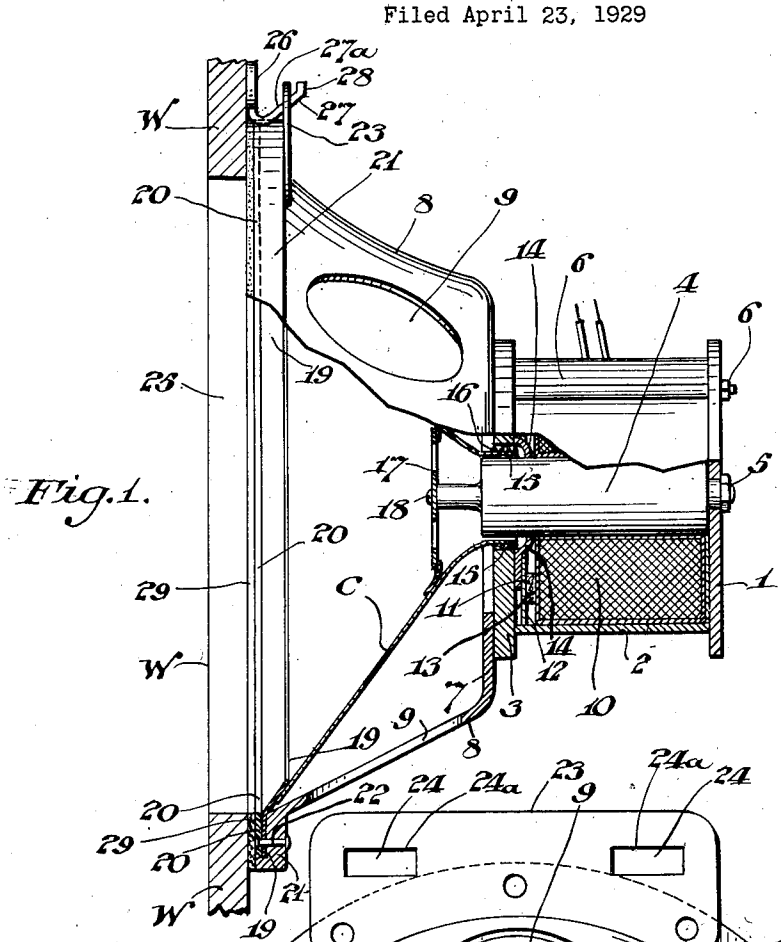

Fig. 1.

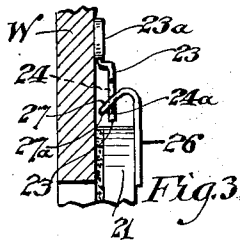

Fig. 3

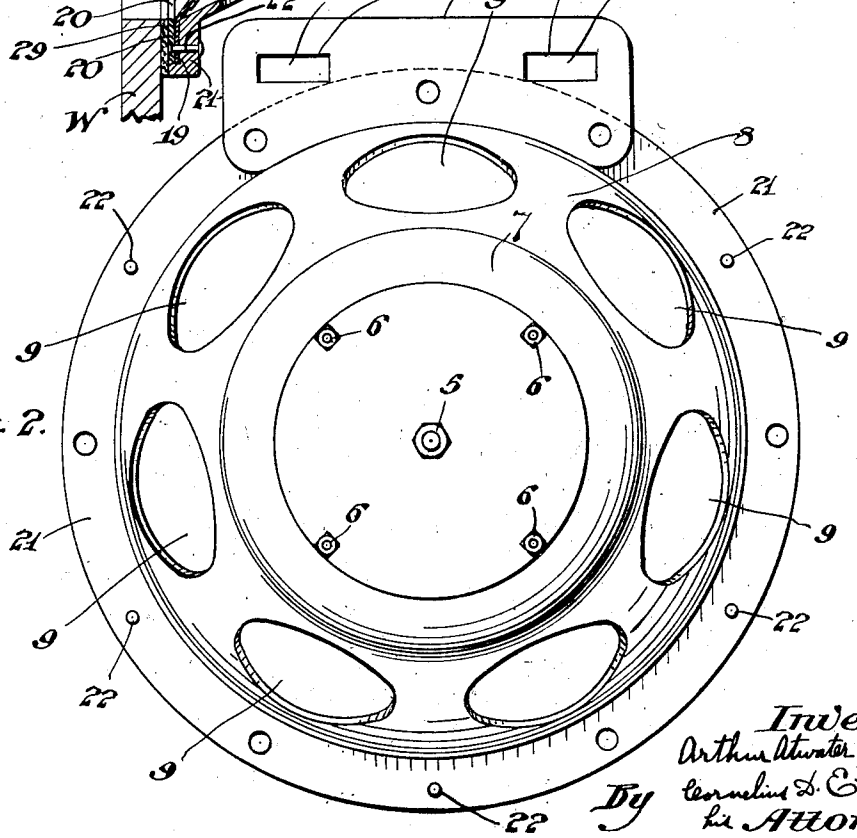

Fig. 2.

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UNITED STATES PATENT OFFICE

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LOUD-SPEAKER MOUNTING

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My invention relates to a mounting for loud speakers, such as are commonly utilized for the reproduction of sound and music in radio broadcast reception, and more particularly to a mounting for a loud speaker having a large or conical diaphragm actuated by an electro-dynamic unit.

It is the object of my invention to provide a simple detachable mounting for a loud speaker upon a support, such as a wall of a radio cabinet, console, or similar furniture of or for radio receiving or phonographic apparatus.

In accordance with my invention an element of a thrust hanger or bracket is secured to a substantially vertical support, as a wall of a radio cabinet, console or like furniture, adjacent a sound aperture or opening therein, and upon it is hung a cooperating element attached to or a part of the loud speaker unit at such point thereof that its weight causes it to be thrust while supported by the thrust bracket or hanger toward and against the support or wall with force sufficient to hold the speaker unit in operative relation to the sound opening, without recourse to screws, bolts or like fastenings.

My invention resides in features of structure and arrangement of the character hereinafter described and claimed.

For an illustration of one of the various forms my invention may take, reference is to be had to the accompanying drawing, in which:

Fig. 1 is a vertical sectional view, partly in elevation, of structure embodying my invention.

Fig. 2 is a rear elevational view of the lould speaker unit.

Fig. 3 is a side view of a modified form of thrust hanger structure.

Referring to the drawing, 1 is a bottom for the casing 2, both of magnetizable material, comprised in the magnetic circuit with the pole plate 3 and core 4, both of magnetizable material, of the field structure of an electro-dynamic system. The core 4 is secured to the bottom 1 by the bolt or stud 5, and the pole plate 3 is held against the end of the casing 2 by the bolts or rods 6 which also pass through the inner flange 7 of the metal housing 8, the latter provided with a plurality of apertures 9.

Surrounding the core 4 is the field winding 10 held against the bottom 1 by pressure of the plate 3 through the disc or washer 12 and intervening compressible elements 13 of felt or equivalent. The ring 11 of brass or other non-magnetizable material, is secured to the pole plate 3 and terminates in the inwardly extending annular ring 14 which centers the plate 3 with respect to the pole 4 to define between the center aperture in the plate 3 and the pole 4 an air gap of substantially uniform radial extent.

Within the housing 8 is disposed a conical diaphragm C of paper or other suitable material having adjacent its one end the cylindrical member 15 of paper, fibre or the like, extending into the aforesaid air gap and carrying or having wound thereon the coil 16 through which the sound-representing current is passed. Attached to the inside of the cone C is the spider 17 secured at 18 to the core 4. The spider is substantially unyielding radially, but is flexible or yielding axially of the cone to permit its axial vibration while it and the coil 15 are supported by the spider in suitable unvarying radial relation or position with respect to the air gap between members 3 and 4.

At its outer edge the cone C has attached thereto the annular flexible hinge-like member 19 clamped between the metal ring 20 and the outer flange 21 of the housing 8 by the screws or rivets 22.

The structure thus far described is a loud speaker unit comprising in general the diaphragm or cone C and its magnetic actuating unit which, in the example illstrated, is of the electro-dynamic type, it being understood however, that any other suitable diaphragm actuating unit or structure may be employed.

The diaphragm actuating unit is of relatively great mass or weight and as will be apparent from Fig. 1, the center of gravity of the speaker unit is far to the right of its front edge as defined, in the example illustrated, by the ring 20 or forward edge of the flange 21.

For detachably mounting the loud speaker unit upon a support or wall which is more or less nearly vertical, there is secured to the flange 21 of the housing 8 a hanger member or plate 23 having one or more apertures 24 (Fig. 2) whose upper edges 24ª may, as indicated, be substantially straight and horizontal.

In Fig. 1, W generically represents a support, as a wall of wood, metal or other material, of a cabinet, console, or other piece of furniture utilized for housing a loud speaker and/or a radio receiving set and/or a phonograph. In the member W is provided the opening or aperture 25. It will be understood, however, that in lieu of the single aperture there may be provided within the area occupied by the aperture 25 a plurality of apertures, grill work or the like.

Above the aperture 25 there is secured to the wall W one or more metal thrust hangers or brackets 26 having the outstanding portion 27 whose upper face 27ª is inclined downwardly toward the wall W. The part 27 preferably has the upstanding lug 28 to prevent dislodgement of the speaker unit from hanger 26.

Preferably there is disposed between the wall W and the front face of the loud speaker unit a ring or washer 29 of felt or the like which provides a seal between the wall and speaker unit.

The loud speaker is applied to the wall W by passing the aperture 24 of the plate 23 over the thrust hanger or bracket 26, with the upper edge 24ª of the aperture 24 in plate 23 engaging the inclined face or surface 27ª of the thrust bracket or hanger.

By its own weight the loud speaker unit tends to ride downwardly toward the left on the surface 27ª, and this force as exerted upon or by the loud speaker unit causes its front or left face to thrust against the felt washer 29, if employed, or against the wall W if the washer 29 be omitted.

Because the center of gravity of the loud speaker unit is far to the right (Fig. 1) and generally between the plate 3 and base 1 in a structure such as illustrated, for example, the weight of the loud speaker unit is in effect concentrated at a point far from the contact of the plate 23 with the thrust bracket or hanger surface 27ª, and causes the lower portion of the left front of the speaker unit, as well as the upper portion thereof, forcibly to thrust against the wall W or washer 29.

The thrust is in a direction substantially parallel to the axis of the cone C and the speaker unit as a whole, against the wall structure W, and is so great, because of the cooperative relation of the plate 23 with the inclined face 27ª, that the speaker unit is held fixedly in place, with the diaphragm or cone C in suitable sound-transmitting relation with respect to the wall aperture 25.

To prevent swinging of the speaker unit parallel to the wall W it is preferred, as indicated, to utilize a plurality of apertures 24 in the hanger plate 23 to coact with a similar number of thrust brackets or hangers upon the wall W.

While in the structure above described that element of the thrust hanger which has the inclined surface 27ª is secured to the support or wall member W, it will be understood that the members 26 and 27 may be relatively reversed, as indicated in Fig. 3, where the plate 23, with its aperture 24, is integral with or secured to the member 23ª which is secured to the rear of the support or wall W, and the member 26, which has a portion 27 having the inclined surface 27ª, is secured to the loud speaker unit, as to the flange 21. In this case the inclined surface 27ª engages upon the surface 24ª at the bottom of the aperture or slot 24.

Structure of the character described affords means for detachably but effectively mounting a loud speaker upon a support, as the wall of a console, cabinet or the like, without recourse to fastening means such as screws, bolts, or the like.

A manufacturer may accordingly produce loud speaker units destined for practically any cabinet or other like furniture and with each speaker unit may be supplied, in addition to the hanger plate 23, a correspondingly suitable number of hanger brackets or plates 26, which is the only structure which is directly or fixedly secured to the cabinet wall.

It is preferable, though not altogether necessary, that the thrust against the wall or support W, or the intervening member 20, should be equal at both the uppermost and lowermost points of engagement of the speaker unit (Fig. 1), i. e., substantially uniform around aperture 25 or throughout the circumference of flange 21 and seal washer 29. This condition will be met when the tangent of the angle between the inclined surface 27ª and the vertical is equal to the distance of the point of contact (between 24ª and 27ª) from the horizontal axis of the speaker unit, particularly such as the axis of the cone C, divided by the distance along that axis between said point of contact and the center of gravity of the speaker unit. The angle of the surface 27ª with respect to the vertical is not generally critical for such equality of pressures, and a tolerance of a few degrees either way is permissible. A compromise value of of the angle of the surface 27ª with respect to the vertical may be utilized where the hanger elements are to be standardized to suit loud speaker units which vary from each other in dimensions and relative location of center of gravity.

What I claim is:

1. The combination with a substantially vertical wall having a sound opening, of a

loud speaker unit, and means for detachably mounting said speaker unit upon said wall in operative register with said opening comprising hanger structure disposed on that side of the center of gravity of said loud speaker unit that by its weight it thrusts against said wall.

2. The combination with a substantially vertical wall having a sound opening, of a loud speaker unit, a seal member intervening between a surface of said unit and said wall, and means for detachably mounting said speaker unit in operative register with said opening comprising hanger structure disposed on that side of the center of gravity of said speaker unit that by its weight it thrusts against said seal member entirely around said opening.

3. The combination with a substantially vertical support having a sound opening, of a loud speaker unit, and means for detachably holding the loud speaker unit upon and against said support in operative relation to said sound opening comprising thrust hanger elements secured respectively to said loud speaker unit and to said support, one of said elements having a surface inclining downwardly and toward said support, and the other of said elements engaging said inclined surface, the center of gravity of said speaker unit disposed on that side of the contact between said hanger elements which causes said speaker unit to thrust against said support entirely around said opening.

4. The combination with a substantially vertical support having a sound opening, of a loud speaker unit comprising a conical diaphragm and a housing therefor, and means for detachably holding the loud speaker unit upon and against said support with said diaphragm in operative relation to said sound opening comprising thrust hanger elements secured respectively to said support and to said housing the center of gravity of said speaker unit disposed on that side of the contact between said hanger elements which causes said speaker unit to thrust against said support entirely around said opening.

5. The combination with a substantially vertical support having a sound opening, of a loud speaker unit having a housing, a seal member disposed between a face of said housing and said wall, and means for detachably mounting said speaker unit in operative register with said sound opening comprising thrust hanger elements secured respectively to said support and to said housing, one of said elements having a surface inclining downwardly and toward said support and the other of said elements engaging said inclined surface, the center of gravity of said speaker unit disposed on that side of said hanger elements that said housing thrusts against said seal member with substantially uniform pressure entirely around said opening.

6. The combination with a substantially vertical support having a sound opening, of a loud speaker unit, and a plurality of thrust hangers disposed on opposite sides of the axis of said said loud speaker unit and each comprising elements secured respectively to said support and to said loud speaker unit, one of said elements having a surface inclining downwardly and toward said support, and the other of said elements engaging said inclined surface on that side of the center of gravity of said speaker unit which causes it by its weight to thrust against said support entirely around said opening.

7. The combination with a substantially vertical wall having a sound opening, of a loud speaker unit having a face adapted to lie against said wall, and means for detachably mounting said speaker unit upon said wall in operative register with said sound opening comprising hanger structure disposed on that side of the center of gravity of said speaker unit that by its weight it thrusts against said wall with pressure substantially uniform entirely around said sound opening.

8. The combination with a substantially vertical wall having a sound opening, of a loud speaker unit, a member disposed between a face of said speaker unit and said wall to effect a seal therebetween, and means for detachably mounting said speaker unit in operative register with said sound opening comprising hanger structure disposed on that side of the center of gravity of said speaker unit that by its weight it thrusts against said seal member with pressure substantially uniform entirely around said sound opening.

9. The combination with a substantially vertical wall having a sound opening, of a loud speaker unit having a face adapted to lie against said wall, and means for detachably mounting said speaker unit upon and against said wall in operative register with said sound opening comprising a thrust hanger element on said wall adjacent said opening, a cooperating element secured on said speaker unit, one of said elements having a surface inclining downwardly toward said wall, the other of said elements engaging said surface, the center of gravity of said speaker unit disposed on that side of said hanger elements that the weight of said speaker unit causes it to bear at said face against said wall with substantial pressure entirely around said sound opening.

10. The combination with a substantially vertical wall having a sound opening, of a loud speaker unit having a face adapted to lie against said wall, and means cooperating with the weight of said speaker unit for detachably supporting the same upon and against said well in operative register with said sound opening comprising thrust hanger elements secured respectively to said wall adjacent said opening and to said speaker unit adjacent said face, one of said elements hav-

ing a surface inclining downwardly toward said wall and the other of said elements engaging said inclined surface, the center of gravity of said speaker unit disposed on that side of the contact between said hanger elements that the overhung weight of the speaker unit effects firm contact between said face and said wall around said sound opening.

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