

PATENT SPECIFICATION



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COMPLETE SPECIFICATION.

Improved Means of Distributing Sound.

I, PAUL GUSTAVUS ADOLPHUS HELMUTH VOIGT, of Spring Grove House, 53, Church Road, Upper Norwood, S.E. 19, British Subject, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to improved means for distributing sound, and is particularly suitable for public address work in places where the audience surrounds the loudspeaker or loudspeakers.

Under these conditions it is at present usual to use a star shaped cluster of six or more loudspeakers, with the horns pointing outwards.

Alternatively, a horn has been proposed which flares excessively, but into the mouth of which a curved conical surface is inserted.

This surface is so fixed and shaped that the sound wave expands according to a logarithmic law, and at the same time turns through a right angle, so that it is radiated all round in a direction at right angles to the axis of the horn.

Another arrangement consists in the use of a short straight sided horn in conjunction with two reflecting surfaces which the sound strikes in turn, the first being a bowl shaped reflector, and the second being in some respects similar to that which I use.

Simpler arrangements in which the sound strikes a cone with straight or curved sides have also been proposed.

According to this invention, I use the horn direct on to a multiple curve sound diverging reflector, which is so shaped that both the high frequencies and the main sounds are spread over the desired area. The shape of the reflector according to this invention is determined by the fact that while the main sounds from the horn (particularly the lower frequencies) are diverging, the higher tones are projected more or less in a beam.

The reflector is therefore made up with a surface which in section is made up of two or more curves so arranged that the sounds "on the beam" are spread over

the desired area, and sounds outside the beam are independently spread over the same area.

In order that this invention may be more easily understood, I shall describe, with the aid of the accompanying drawings, some of the many ways of carrying it into effect.

Fig 1 illustrates a horn pointing down at such a reflector, H being a diagrammatic representation of the horn, R_1 representing the surfaces of the reflector, and S_1 S_2 representing the direction taken by imaginary sound waves striking the surface R_1 near the centre and S_3 S_4 that of sound waves striking the surface R_2 , which spreads the sound waves further from the centre.

In cinemas, it is frequently necessary to use several horns to cover the audience. Here again, a suitable reflector can be used to distribute the sound in any desired direction, and the use of such a reflector may have the secondary advantage, that the axis of the horn may lie more or less parallel to the screen, and therefore save a considerable amount of space behind the screen.

Fig. 2 shows in section this use of the reflector, having a combination of two surfaces, while Fig. 3 shows an alternative shape.

More complicated contours could be used without departing from the spirit of this invention.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1) A horn type loudspeaker and a reflecting surface in conjunction, so placed and shaped that when the horn projects sound onto it, the sound after being developed in the horn, is reflected, and spread over a greater angle than that covered by the horn alone, the reflecting surface being characterised in this that its contour is made up of more than one curve, so that sound on the beam of the loudspeaker is spread independently of the sound away from the beam.

[Price

2) Loudspeakers in conjunction with
multiple surface reflectors, substantially
as described and illustrated.

Dated this 29th day of May, 1933.

P. G. A. H. VOIGT.

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[This Drawing is a reproduction of the Original on a reduced scale.]

