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J. C. KARNES

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SOUND LOCATING APPARATUS

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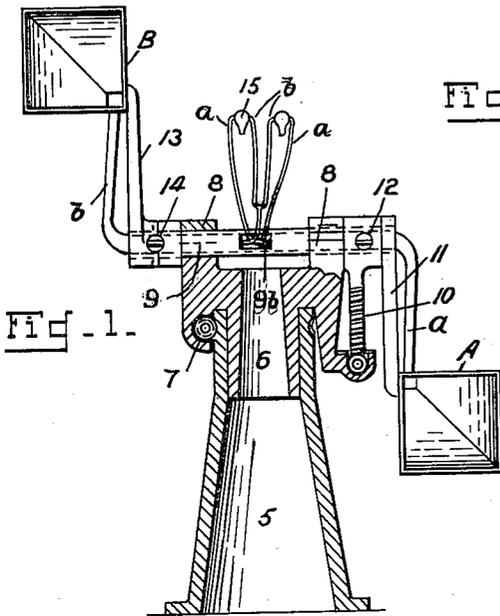


Fig. 1.

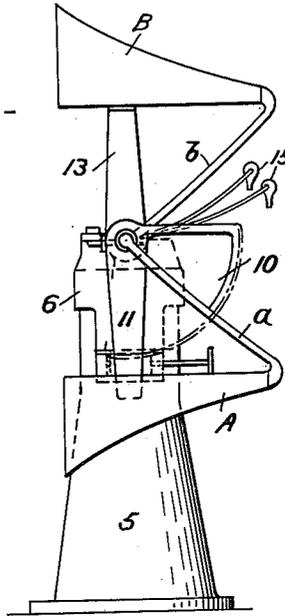


Fig. 2.

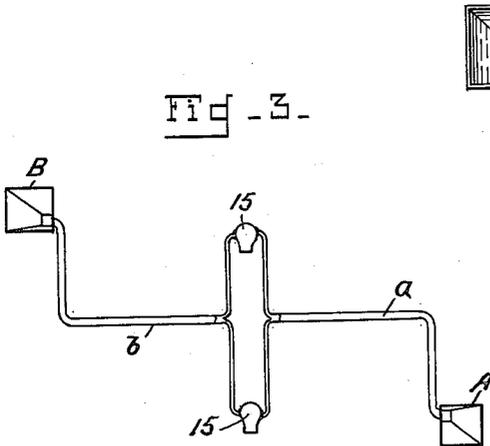


Fig. 3.

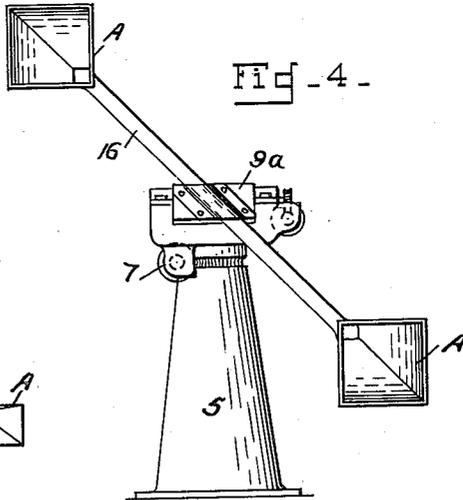


Fig. 4.

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## SOUND LOCATING APPARATUS

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(GRANTED UNDER THE ACT OF MARCH 3, 1883, AS AMENDED APRIL 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

5 This invention relates to a sound locating apparatus of the type operating according to a system of binaural comparison in which the apparatus is directed at the source of sound and the listener reduces the phase difference  
10 to zero.

In general, apparatus of this character includes two pairs of horns arranged on intersecting base lines to respectively afford lateral and vertical impressions of direction in  
15 azimuth and in elevation.

The purpose of the present invention is to effect a reduction in the size and weight of the apparatus by employing only one pair of horns arranged on an oblique base line  
20 whereby lateral and vertical separation is provided respectively for the azimuth and elevation listener.

To these and other ends, the invention consists in the construction, arrangement and combination of elements described herein-  
25 after and pointed out in the claims forming a part of this specification.

A practical embodiment of the invention is illustrated in the accompanying drawing,  
30 wherein:

Fig. 1 is a view in front elevation, parts in section showing the improved apparatus pointed at zero elevation.

Fig. 2 is a view in side elevation thereof.

Fig. 3 is a schematic view showing the grouping of the horns.

Fig. 4 is a view in front elevation of a modified apparatus.

Referring to the drawing by characters of  
40 reference.

The mount consists of a base 5 on which is supported a top carriage 6 that is rotated in azimuth by means of gearing 7. The top carriage is formed with a pair of spaced arms 8—8 adapted to trunnion a horizontally disposed support 9 that is rotated about its axis  
45 by means of gearing 10.

The support 9 extends beyond the arms 8  
50 and carries a pair of crank arms on its ex-

terminities. One of the crank arms 11 carries an element of the gearing 10 and is fixed in one position on the support by means of the pin 12. The other crank arm 13 is securable  
55 to the support by means of a pin 14 in two positions of adjustment, the normal position being at 180 degrees from the crank arm 11 and the other position which is employed in traveling, corresponding to the arm 11.

A pair of horns A and B are respectively  
60 mounted on the crank arms 11 and 13 and are in parallel relation perpendicular to the crank arms. Flexible sound conducting tubes *a* and *b* leading from the horns A and B are conducted through the support 9 and issue  
65 from a central aperture 9*b*. The adjoining ends of the tubes are divided so that the branches of one tube may be paired with the branches of the other tube. The pairs are  
70 attached to head sets 15—15 either one of which may be used by the azimuth listener or by the elevation listener. The horns as  
75 arranged are positioned at the ends of a base line that is oblique to the axes of rotation, and the vertical distance between planes of the horns is equal to the horizontal distance between planes of the horns.

In the modification shown in Fig. 4, the horns are mounted on the ends of an arm 16  
80 disposed obliquely to the support 9*a* and attachable to the center thereof. In this arrangement the obliquity of the arm may readily be varied to alter the horizontal and vertical distances between the horns.

I claim:

1. In a sound apparatus, a mount, a support trunnioned on the mount, a crank arm on each end of the support, said arms being normally 180 degrees apart, a horn on each  
90 arm, and a flexible sound conducting tube leading from each horn and having a divided end, the divisions of one tube being paired with the divisions of the other tube.

2. In a sound apparatus, a mount, a sup-  
95 port trunnioned on the mount, a crank arm on each end of the support, said arms being normally 180 degrees apart, a horn on each arm, and means for coupling the horns to provide two sound receiver sets. 100

3. In a sound apparatus, a support movable about a horizontal and a vertical axis, spaced horns carried by the support on a line oblique to the axes of movement of the support.

5 4. In a sound apparatus, a pair of sound receivers mounted for movement in azimuth and elevation and spaced equally in two planes and means for coupling the sound receivers to provide two sound receiver sets.

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