

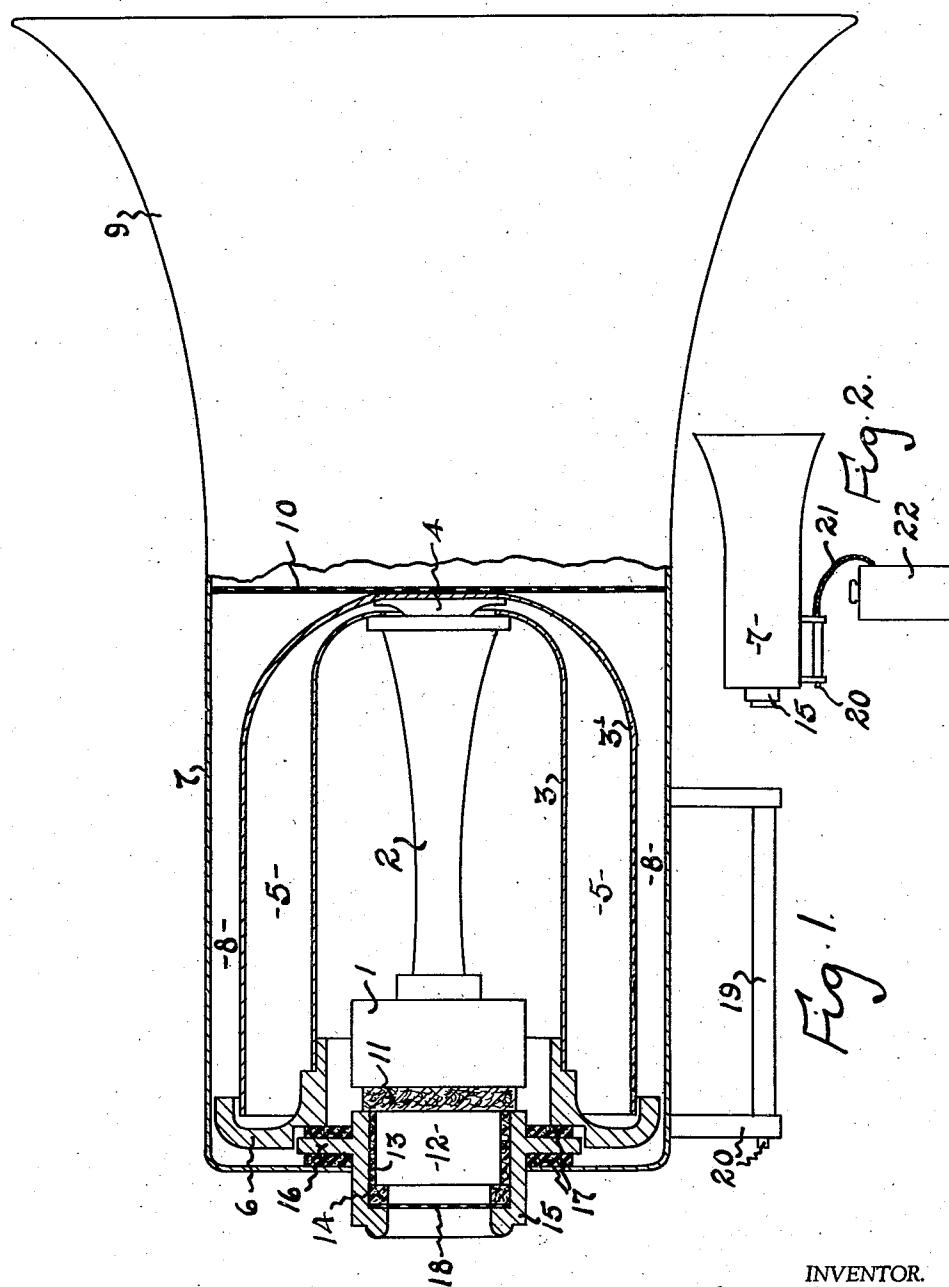
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ELECTRIC MEGAPHONE

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ELECTRIC MEGAPHONE

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This invention is concerned with an electric megaphone by means of which sounds, such as spoken sounds, supplied to one end of the device issue from the other end in greatly amplified volume.

An object of the invention is the provision of a simply controlled, portable device for use in place of the ordinary megaphone and by means of which a speaker's voice may be greatly amplified and easily directed as required.

Another object of the invention is the provision in a single portable instrumentality, of a combination microphone and loud speaker respectively associated so as not to cause any electrical interference therebetween when interconnected by means of an amplifier.

A more general object of the invention may be said to be the provision of an electric megaphone by means of which sounds delivered thereto may be greatly amplified in volume.

Other and more detailed objects of the invention will become apparent from the following detailed description of one embodiment thereof.

This invention resides substantially in the combination, construction, arrangement and relative location of parts, all as will be explained in full detail hereinafter.

In the accompanying drawing,

Figure 1 is a vertical, central, longitudinal, cross-sectional view, with some parts in elevation, of the combination microphone loudspeaker unit comprising part of the complete electric megaphone combination.

Figure 2 is an elevational view of the complete unit comprising this invention.

As illustrated in the drawing, the complete combination of the invention includes a megaphone unit made up of a microphone of any suitable type and a loudspeaker of any suitable type, all enclosed within a housing constructed to provide a folded horn for acoustically amplifying and directing the issuing sounds.

As illustrated, the device consists of a loudspeaker unit 1, of any suitable type such as a permanent magnet form, provided with a horn consisting of a tubular extension 2 in the mouth of which is secured a support, without completely obstructing the passage through the extension. Surrounding the loudspeaker unit is an annular support 6 provided with a cylindrical seat on which one end of the annular wall member 3 is mounted at one end. The other end of this annular tubular member 3 is secured to the end of the tubular extension 2 in any suitable manner so as to enclose and seal the chamber within

which the loudspeaker unit 1 and the tubular extension 2 are mounted.

5 A second annular wall forming member 3' is secured at one end to the support 4 and extends from that support back towards the support 6 but terminates short thereof, as clearly shown in Figure 1. The wall forming members 3 and 3' define an annular space 5 which forms a reversely extending annular passage in communication with the passage through the tubular extension 2. Surrounding these elements is an outer cylindrical or other suitably shaped housing 7 which with the wall member 3' forms another annular passage 8 which is in communication 10 with the passage 5 around the end of the wall member 3'. At its other end the passage 8 is in communication with the atmosphere through the bell or flared end 9 of the housing 7.

As will be recognized, the members 2, 3, 3' 20 and 7 together form a folded horn, the entrance to which is at the loudspeaker unit and the exit of which is at the mouth of the bell. By means of this construction a relatively long sound channel is formed in a compact manner to provide 25 the advantages and benefits of the much larger construction which would result if they were placed end to end.

Preferably the passage at the base of the bell 9 is covered with a suitable porous or screen member 10, behind which the parts are hidden but without in any way interfering with the issuing sound waves.

30 Interposed between the end wall of the housing 7 and the annular support 6, by means of an annular flange 16, is a cylindrical housing 15 which is open at both ends. The flange 16 is gripped between these members by rubber gaskets 2 and all of these parts may be secured together in any suitable manner, such as by means of bolts or rivets (not shown). By this construction the various compartments are sealed with respect to each other and with respect to the outer atmosphere.

35 Mounted within the cylindrical housing 15 is a microphone 12 of any suitable construction. The periphery of the microphone housing is enclosed within a tube 13 of any suitable material, such as a soft fibrous material. The microphone housing 12 and the loudspeaker unit housing 1, 40 are spaced apart and interposed between them in a thick disc or layer 11 of felt.

45 Likewise interposed between the housing 15 and the microphone housing 12 is a gasket 4 of felt. The open outer end of the housing 15 is closed 50 off by a porous wall 18 which may be in the form

of a porous fabric or a metal screen. The sound receiving side of the microphone unit, of course, faces the open end wall of the housing 15 so as to be exposed to sound waves directed thereinto. Otherwise the microphone unit is completely housed and sealed and is so mounted as to be as little subject as possible to disturbing vibrations. It will likewise be seen that by reason of the gaskets 16 and 17, as well as fibrous tube 13, and the felt wall 11, the microphone is sound insulated from the various passages within the horn, and is also isolated from mechanical vibrations induced by the loudspeaker unit in the entire structure, as well. Thus an important and novel feature of this invention is the space relationship between the microphone and the loudspeaker and the physical structure by means of which they are incorporated into one unit, so that mechanical and acoustical feedback between the two is eliminated.

Attached to the housing 1 at any suitable place as at the bottom, is a properly formed handle 19 provided with an easily accessible finger operated switch 20 by means of which the apparatus may be cut into and out of use.

The general combination is illustrated in Figure 2 wherein a portable amplifier of suitable type, such as a battery operated vacuum tube amplifier 22, is shown connected by a cable 21 with the necessary number of conductors to the microphone unit. As illustrated this cable extends to the handle 19 and to the switch mounted thereon. From it the individual conductors may extend to and for connection to the microphone and loudspeaker units in accordance with well known practice.

Thus as will be readily understood, the microphone will be connected through the cable 21 to the input of the amplifier, while the loudspeaker will be connected to its output. The switch 20 may control the circuits in any suitable manner, as by simply interrupting the microphone circuit when open or by interrupting the energizing circuits for the amplifier when open. The details of circuit connection do not form any novel part of this invention.

From the above description the nature and use of the invention will be apparent to those skilled in the art. The user will either carry the portable amplifier on his back or in his pocket, or leave it on the ground if the cable 21 is long enough. The megaphone unit is held preferably by the handle and when it is to be used the speaker closes the switch 20. With switch 20 closed sounds entering the opening in the housing 15 impinge upon the microphone causing it to translate the sound waves into electrical current representations thereof.

These currents pass through the amplifier and then are supplied to the loudspeaker unit 4 which acts to convert these amplified electrical currents into reproductions of the original sound, but at magnified volume as they are projected from the bell of the unit. Thus by means of this simple device the user speaking in ordinary tones may project his voice in properly amplified volume in the desired direction. As is obvious the operation of the apparatus is simple and indeed its use is no more complicated than the usual form of megaphone consisting of nothing more than an elongated horn. The microphone and loudspeaker have been so associated that the sound waves may not be by-passed from one to the other and at the same time the two de-

vices being spatially 180 degrees apart, prevent acoustical feedback between the two.

In order to attain the object of this invention in a practical way it is highly desirable that the loudspeaker unit be of the type which is markedly directional. The speaker and horn to be of a type which radiates most of the sound generated thereby substantially in a narrow cone from its mouth symmetrical with the axis of the horn. In view of the fact that the directivity of a loudspeaker tends to become less sharp at lower frequencies, it is important that the frequencies radiated by the electric megaphone be limited to those in the frequency spectrum which are sufficient to permit intelligible speech to be transmitted and yet are within the range of frequencies for which the horn maintains its highly directional properties. By using a sharply directional loudspeaker one of the important objects of this invention is obtained. This object, as previously referred to, is that of preventing acoustical feedback between the loudspeaker and the microphone. Therefore, in addition to placing these two devices so that they are 180 degrees apart in space, a highly directional loudspeaker is employed, thereby minimizing any tendency to feedback acoustically. To re-emphasize the point, mechanical feedback through the structure of the device is prevented by thoroughly insulating the loudspeaker and microphone from each other against the transmission of vibrations therebetween through the structure of the unit. The insulating structural features likewise serve to isolate the units from any direct airpath connections so as to contribute to the prevention of acoustical feedback.

It will of course, be apparent to those skilled in the art that in view of the fact that vacuum tube amplifiers of considerable amplifying power are available at the present time in small physical units, that the amplifier may readily be incorporated when desired directly in the electric megaphone unit, whereby all the apparatus of this invention may be incorporated, when it is practical, in a single housing.

From the above description it will be apparent to those skilled in the art that the novel subject matter of this invention may be embodied in other specifically different physical forms and I do not, therefore, desire to be strictly limited to the disclosure as given for purposes of illustration, but rather to the scope of the claims granted me.

What is claimed is:

1. In an electric megaphone, the combination including a microphone and a loudspeaker, means for supporting said microphone and loudspeaker in back to back relation, and a housing for said units comprising a folded horn having an entrance and an exit, the entrance of said horn being connected to said loudspeaker and said housing having an opening at which the microphone is positioned, the exit of said horn and the microphone opening being spatially displaced 180°.

2. In an electric megaphone, the combination comprising a microphone unit and a loudspeaker unit positioned back to back, a housing enclosing said units and having openings at opposite ends, said microphone being positioned opposite one of said openings, and a plurality of telescoped wall members within said housing forming a continuous tortuous path with said housing, the innermost of said wall members being connected to the loudspeaker and the other of

said housing openings forming the terminal end of said tortuous path.

3. In an electric megaphone, the combination comprising a microphone unit and a loudspeaker unit positioned back to back, a housing enclosing said units and having openings at opposite ends, said microphone being positioned opposite one of said openings, a plurality of telescoped wall members within said housing forming a continu-

ous tortuous path with said housing, the innermost of said wall members being connected to the loudspeaker and the other of said housing openings forming the terminal end of said tortuous path, an electric amplifier and circuits for interconnecting the microphone and loudspeaker with the amplifier.

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