

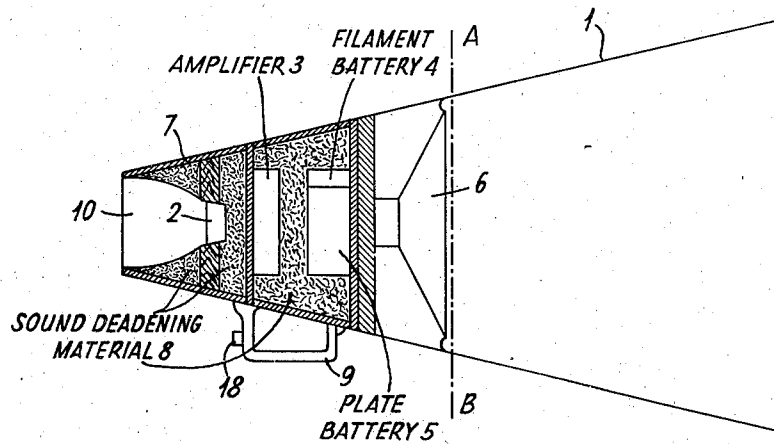
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ELECTROACOUSTIC MEGAPHONE

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ELECTROACOUSTIC MEGAPHONE

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This invention relates to an improved electroacoustic megaphone or audio signalling apparatus.

An object of this invention is to simplify and improve electroacoustic apparatus generally. Briefly, by this invention, the method of guiding tourists, sports events on a small scale, pickup and transmission of individual directive solo rendition from a member of an orchestra, transmission of commands on small vessels, etc., is greatly improved. With the present-day devices, such as a megaphone, there is required a great deal of physical or vocal effort on the part of the speaker to have his voice carried to a large number of people. Therefore, in order to make this task easier, there is evolved by this invention a miniature electroacoustic outfit which may be independently used without connection to power mains. Also, this outfit is light and compact and comprises means which when it is to be used for a relatively long time is adapted to be screwed fast upon a tripod or suitable suspension members.

In a great many instances it is necessary that the voice of a person should reach the ears of a great number of listeners even over a relatively great distance. In sporting events, mass demonstrations, landing maneuvers of ships, in military arts and activities, etc., there is an urgent demand for an order transmission outfit, which will combine low weight with long operating range so as to benefit and impart information to a great number of persons. In the past, the megaphone has been used for this purpose on many occasions. In order that a megaphone may work over relatively great distances, or to make oneself intelligible in its use when there is a high noise level, it is necessary to talk very loudly or yell into the megaphone. The result is that whatever benefits may normally be derived from its use are largely offset by the loudness of the voice.

Now, the art of electroacoustics affords ways and means to create a megaphone which, while of low weight, will satisfy all demands to be made of such a device as regards operating range and action on persons to be so reached.

It is known in the earlier art that for order transmission, a microphone combined with a loudspeaker built into a horn may be used. However, apparatus of this kind involves the drawback that it is of comparatively large weight. Moreover, it is mounted in a fixed place and therefore dependent upon amplifier means connected with a supply line or a generator built into a power-propelled vehicle. These factors preclude its use and utility in many instances.

This invention will best be understood by referring to the accompanying drawing.

Now, according to this invention, the drawbacks of order and intelligence transmission (signal and communication) apparatus are avoided by combining a microphone, a battery-operated audio frequency amplifier, and a small loudspeaker system working upon a megaphone horn, into a single operating unit. Tests have shown that a megaphone may thus be created which has a weight ranging between four and five kilos, and this is not unduly high considering the practical advantages gained thereby.

The tapered end of the megaphone is shut by a casing in which are accommodated a tiny funnel or horn or a free-radiation loudspeaker, an audio frequency amplifier for battery operation, and pocket or flash-lamp battery for the filament, as well as a small plate battery for supplying the anode potential. In the cover forming the posterior closure is fitted the microphone which on the side turned towards the loudspeaker is so packed and tightened that no acoustic feedback is feasible. More particularly speaking, it is advantageous to fill the space between the microphone and the loudspeaker with sound-deadening or absorbent substances, and also to line or drape the casing walls therewith. If desired, also a directional microphone may be used for which the direction of lowest sensitiveness coincides with the direction of maximum sound intensity of the loudspeaker. For transportation purposes, it may be advantageous to build the casing containing the electroacoustic means properly so-called and the megaphone funnel or horn itself as independent parts and to accommodate the casing inside the horn for transportation, thereby reducing the overall shipping length of the outfit to a considerable extent. Tests have shown that intelligibility with the device hereinbefore described is extremely satisfactory. The working range or coverage of a conventional megaphone is far surpassed without it being necessary to make extra efforts in talking into the device. In fact, a subdued voice or mode of speaking in most instances is quite satisfactory.

The entire unit may be held in one hand by grasping a grip or handle, the latter being conveniently so disposed that the device is supported in the center of gravity. In order to limit the current supply from the batteries to a minimum, a double switch according to another object of the invention is provided which is built into the grip or handle and which is readily opened and closed by action of the thumb of the hand holding the

device, but this switch may also be of the automatically opening type, that is, a switch which will be closed only when the handle of the device is gripped. In this manner, one makes sure that the amplifier is not impressed with potential as soon as the device is placed aside. Moreover, the connecting and disconnecting switch could also be designed so as to act as a volume control or else it may be combined with a volume control means, the element adapted to actuate the control consisting conveniently of a notched or knurled wheel which may be turned by the thumb of the hand holding or gripping the device. Thus, only one hand is required to operate the device. The other hand is free and usable for assisting in the holding, etc., and this may be advantageous in many instances. For instance, in oar and sail boats, one hand would thus be free for operating the rudder.

The drawing shows an exemplified embodiment of the object of the invention.

In the megaphone horn made preferably of aluminum sheet 1 are accommodated the microphone 2, the amplifier 3, the filament battery 4, the plate battery 5 and the loudspeaker 6. The shell of the casing containing microphone, amplifier and the batteries are lined with sound deadening materials (draping) indicated at 7. The interior of the casing itself is filled with sound deadening or absorbing substances 8. When placing sound deadening materials in the neighborhood of the part or section which contains the amplifier, care must be taken so that the heat dissipated by the amplifier has a chance to be carried away lest accumulation of heat happen to an extent liable to endanger the drape material. The handle or grip 9 is so mounted that the device is supported in its center of gravity. The acoustic inlet of the microphone is indicated at 10. The switch 11 is operable by the thumb of the hand holding the grip 9. It is preferably of the push-button type designed to switch the filament and battery voltage supply on and off. As soon as the device is laid aside, the pressure-operated contact is grounded so that the device is rendered dead. The switch 11, as before stated, could also be designed so as to act as a volume control, or else a volume control could be placed in its neighborhood so as to be rendered operable also by the thumb or another finger of the hand gripping the unit. The actuating element of the control consists preferably of a notched or milled (knurled) wheel disposed so as to be readily rotatable by the finger.

The device may be so designed that it is split along the line indicated at A-B. The left-hand part of the device which contains the acoustic means properly so-called may thus be fitted into the right-hand end comprising the funnel or horn, with the result that the overall shipping length of the device is greatly reduced. In such case, the handle is conveniently hingeable or fulcrumed.

If in the neighborhood of the site of use of the megaphone, a source of electrical energy is available, say, a lighting circuit, electric distributor system on board a vessel, or an electric supply source on a power-propelled craft, or the like, the unit can be still further reduced in weight because of the fact that the batteries may then be dispensed with. Since the amplifier is then to be designed so as to be operable on a supply-line, it should preferably be of the universal type, that is, operable on any current at all. All that is

required in addition is a lead to join the megaphone and the socket connecting with the available source of supply. In order to meet all practical requirements, it is also feasible in special instances to design the amplifier so that it may be fed from mains as well as from batteries, the necessary connections being established by the agency of a switch which will unite the device with proper circuit means for battery operation and supply-line operation. When such a scheme is employed, care should be taken so that the removal of the batteries or power unit terminal parts should be easy in order that the device may not be burdened unnecessarily by the weight of such parts as are not needed for the particular form of operation adopted at a given time.

What is claimed is:

1. An electroacoustic megaphone comprising a cone-shaped casing having a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker centrally located within the axis of said casing at a position intermediate the microphone and the large end of said casing, and electrical means interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing.

2. An electroacoustic megaphone comprising a casing having tapered side walls with a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker centrally located within the axis of said casing at a position intermediate the microphone and the large end of said casing, and electrical means interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing.

3. An electroacoustic megaphone comprising a casing having tapered side walls with a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker located within the axis of said casing at a position intermediate the microphone and the large end of said casing, sound deadening means located between said microphone and said loud speaker, and electrical means including an audio amplifier and a plurality of batteries interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing.

4. A directive electrical acoustic megaphone comprising a casing having tapered side walls with a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker located within the axis of said casing at a position intermediate the microphone and the large end of said casing, and electrical means interposed between said microphone and said loud speaker whereby the direction of lowest sensitiveness coincides with the direction of the maximum sound intensity of said loud speaker so that sound waves are electrically and acoustically amplified as they leave the large aperture of said casing.

5. An electroacoustic megaphone comprising a

casing having a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker centrally located within the axis of said casing at a position intermediate the microphone and the large end of said casing, electrical means interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing, and a supporting handle located at the center of gravity of said megaphone.

6. An electroacoustic megaphone comprising a casing having a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker centrally located within the axis of said casing at a position intermediate the microphone and the large end of said casing, electrical means interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing, a supporting handle located at the center of gravity of said megaphone, and a switch adjacent said handle and connected so as to actuate said electrical means.

7. An electroacoustic megaphone comprising a casing having a small aperture at one end and a

large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker centrally located within the axis of said casing at a position intermediate the microphone and the large end of said casing, electrical means interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing, a supporting handle located at the center of gravity of said megaphone, and a switch and a volume control device adjacent said handle and connected so as to actuate said electrical means.

8. An electroacoustic megaphone comprising a casing divided into a small and a large portion, said small portion having a small aperture at one end and a large aperture at the other end, a microphone centrally located at the small end and within the axis of said casing, a loud speaker located within said casing at a position intermediate the microphone and the large end of said small casing portion, means adjacent said loud speaker for joining the large and small portions of said casing together, and electrical means interposed between said microphone and said loud speaker whereby sound waves entering the small aperture in the end of said casing are electrically and acoustically amplified as they leave the large aperture of said casing.

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