

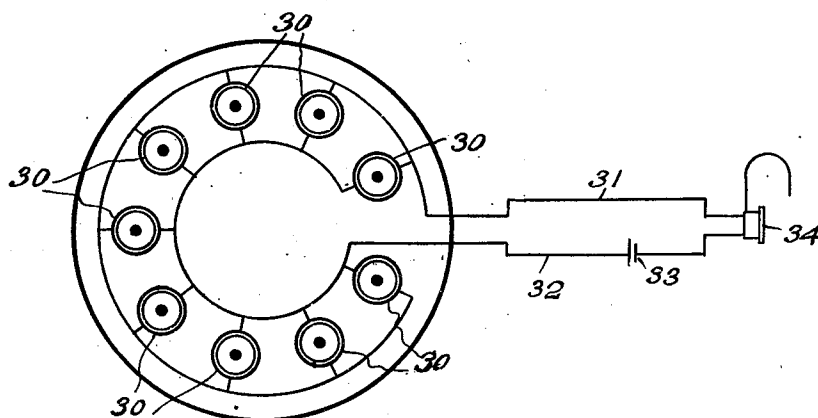
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R. A. FESSENDEN

MEANS FOR ELIMINATING DISTURBING NOISES

Original Filed Aug. 20, 1917



INVENTOR=  
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HIS ATTORNEYS=

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# UNITED STATES PATENT OFFICE.

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## MEANS FOR ELIMINATING DISTURBING NOISES.

Original application filed August 20, 1917, Serial No. 187,121. Divided and this application filed September 7, 1918. Serial No. 253,102.

*To all whom it may concern:*

Be it known that I, REGINALD A. FESSENDEN, of Brookline, in the county of Norfolk and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Means for Eliminating Disturbing Noises, of which the following is a specification.

My invention relates to the generation, transmission and utilization of energy and more particularly to the generation and receipt of signals and still more particularly to the elimination of disturbing signals and influences and water noises, such as cause disturbance in submarine signaling and detecting submarines.

The object of my invention is to obtain increased efficiency in these lines.

This case is a division of application Serial No. 187,121, filed by me August 20, 1917.

The drawing shows diagrammatically apparatus embodying my invention.

The drawing shows a means for eliminating disturbing noises, the utility of which is based upon the discovery made by applicant that if a number of receiving mechanisms are connected in parallel with each other and preferably in one plane and in series with the receiver, water and other disturbing noises will be practically eliminated and the only sounds received without diminution will be those generated at a distance from the plane of the receiving mechanisms and at a point perpendicular to the plane of the receiving mechanisms.

For example, 40 is a diaphragm, which may be merely a supporting surface and say two feet in diameter; 30, 30, 30 are inertia microphone buttons or magnetophones attached to the diaphragm 40, as shown, and connected in parallel with each other and in series with the receiver 34 by the leads 31, 32. 33 is a battery.

Water noises or other disturbing local noises will not reach a microphone all at the same instant and consequently the changes in current in the different microphones will be of different phases and consequently each microphone will be short-circuited as regards those noises by all the other microphones.

The same will apply to sounds striking the diaphragm at an angle, since the sound

will reach the diaphragm on the near edge before it reaches the diaphragm on the far edge. Consequently, the sounds arriving from the side will be weakened. But sounds arriving normally to the diaphragm will actuate all the microphones or magnetophones at the same instant, and consequently the indication produced on the receiver 34 will be a maximum.

Consequently, in the type of apparatus shown not only are disturbing noises reduced to a minimum but there is also a strong directional effect.

What I claim as my invention is:—

1. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and at such large distance from each other and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects upon said receivers located at a distance from each other in different and opposing phases; and the impulses produced in the medium by the desired signals will impress their effects in the same phase; whereby the effect of said undesired signals and disturbing noises is minimized; and an indicating mechanism operatively connected to all of said receivers whereby the desired signals may be detected.

2. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and on a common surface, said common surface being of such large dimensions that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; whereby the effect of said undesired signals and disturbing noises is minimized; and an indicating mechanism operatively connected to all of said receivers whereby the desired signals may be detected.

3. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and on a common surface, said common surface being of such large dimensions and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; whereby the effect of said undesired signals and disturbing noises is minimized; and an indicating mechanism operatively connected to all of said receivers whereby the desired signals may be detected.

4. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and on a common surface, said common surface being of such large dimensions and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; and impulses produced by the desired signals will impress their effects on said receivers in similar and assisting phases, and an indicating mechanism operatively connected to all of said receivers whereby said desired signals may be detected.

5. Apparatus for the receipt of signals and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers, operatively connected to act simultaneously and conjointly and said receivers being connected in parallel with each other and located in a sound-transmitting medium and at such large distance from each other and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects upon said receivers located at a distance from each other in different and opposing phases; and the impulses produced in the medium by the desired signals will impress their effects in the same phase; whereby the effect of said undesired signals and disturbing noises is minimized; and an indicating mechanism operatively connected to said receivers whereby the desired signals may be detected.

6. Apparatus for the receipt of signals and for eliminating the disturbing effect of undesired signals and noises comprising a

plurality of receivers, operatively connected to act simultaneously and conjointly and said receivers being connected in parallel with each other and located in a sound-transmitting medium and on a common surface, said common surface being of such large dimensions that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; whereby the effect of said undesired signals and disturbing noises is minimized; and an indicating mechanism operatively connected to said receivers whereby the desired signals may be detected.

7. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and at such large distance from each other and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects upon said receivers located at a distance from each other in different and opposing phases; and the impulses produced in the medium by the desired signals will impress their effects in the same phase; whereby the effect of said undesired signals and disturbing noises is minimized.

8. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers mounted on a common surface operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and said common surface being of such large dimensions that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; whereby the effect of said undesired signals and disturbing noises is minimized.

9. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers mounted on a common surface operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and said common surface being of such large dimensions and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases, whereby the effect of said

undesired signals and disturbing noises is minimized.

10. Apparatus for the receipt of signals comprising both desired and undesired impulses and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers mounted on a common surface operatively connected to act simultaneously and conjointly and located in a sound-transmitting medium and said common surface being of such large dimensions and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; and impulses produced by the desired signals will impress their effects on said receivers in similar and assisting phases.

11. Apparatus for the receipt of signals and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers operatively connected to act simultaneously and conjointly, said receivers being connected in parallel with each other and located in a sound-transmitting medium and at such large distance from

each other and so oriented that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects upon said receivers located at a distance from each other in different and opposing phases; and the impulses produced in the medium by the desired signals will impress their effects in the same phase; whereby the effect of said undesired signals and disturbing noises is minimized.

12. Apparatus for the receipt of signals and for eliminating the disturbing effect of undesired signals and noises comprising a plurality of receivers, operatively connected to act simultaneously and conjointly, said receivers being connected in a parallel with each other and located in a sound-transmitting medium and on a common surface, said common surface being of such large dimensions that the impulses produced in the medium by undesired signals and disturbing noises will impress their effects on said receivers located on different parts of the common surface in different and opposing phases; whereby the effect of said undesired signals and disturbing noises is minimized.

REGINALD A. FESSENDEN.