No. 701,166. Patented May 27, 1902.

E. DE MEULEMEESTER.

APPARATUS FOR THE RECEPTION OF SOUND SIGNALS FOR NAUTICAL PURPOSES.

(Application filed Sept. 28, 1901.)

(No Model.) 3 Sheets—Sheet 1.

Fig. 5.

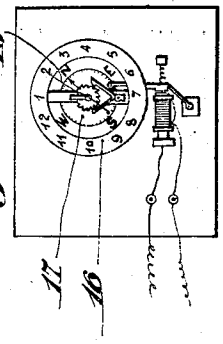


Fig. 2.

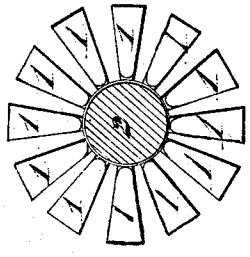


Fig. 4.

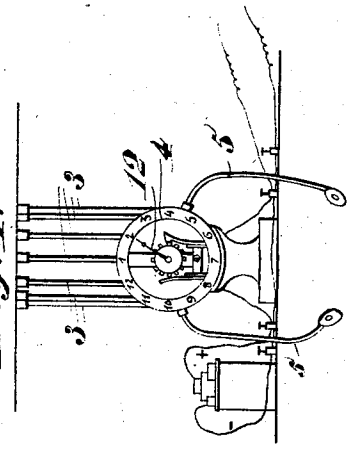


Fig. 1.

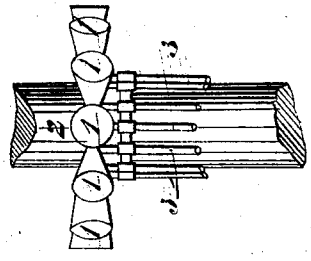
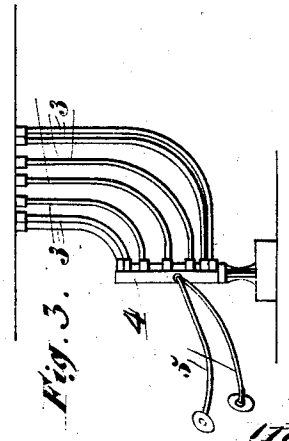


Fig. 3.



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Fig. 7.

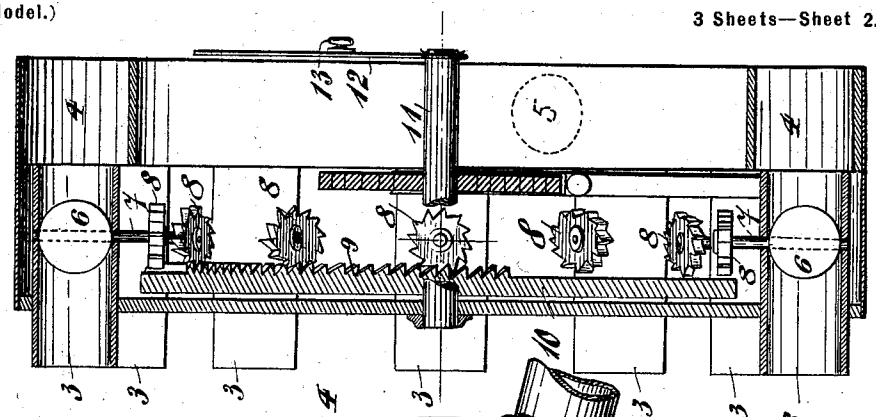
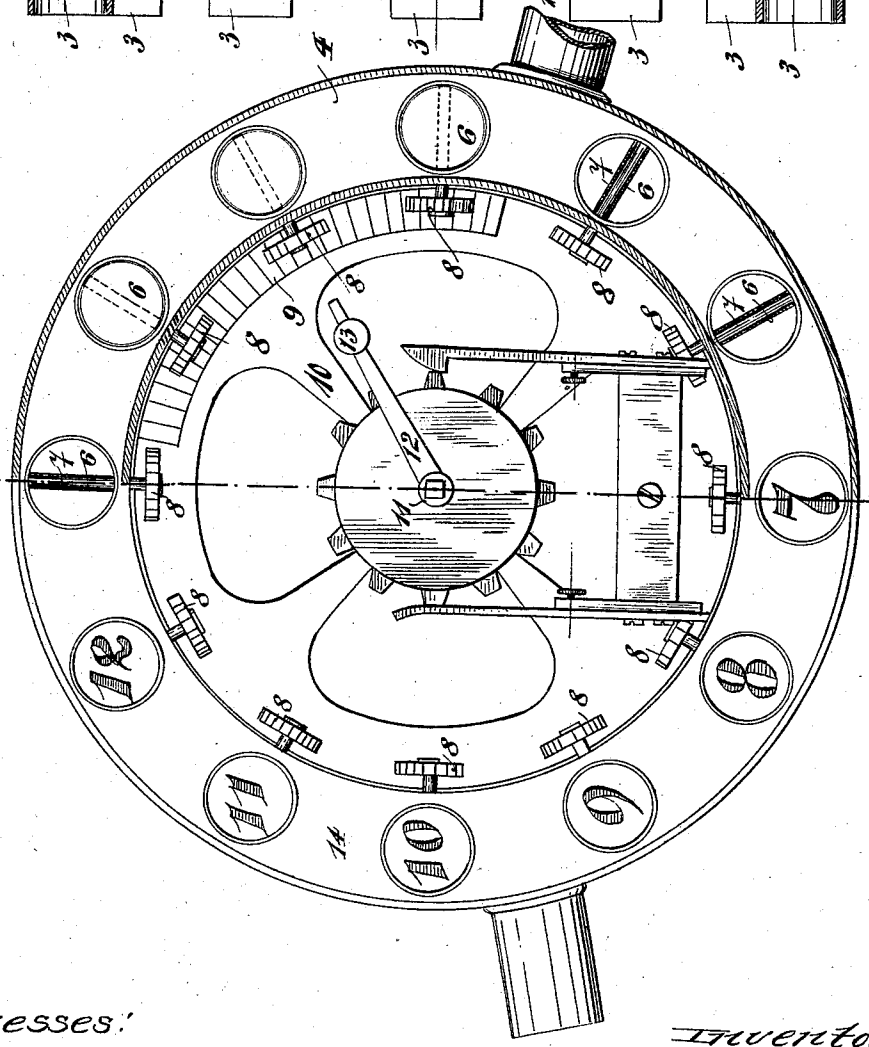


Fig. 6.



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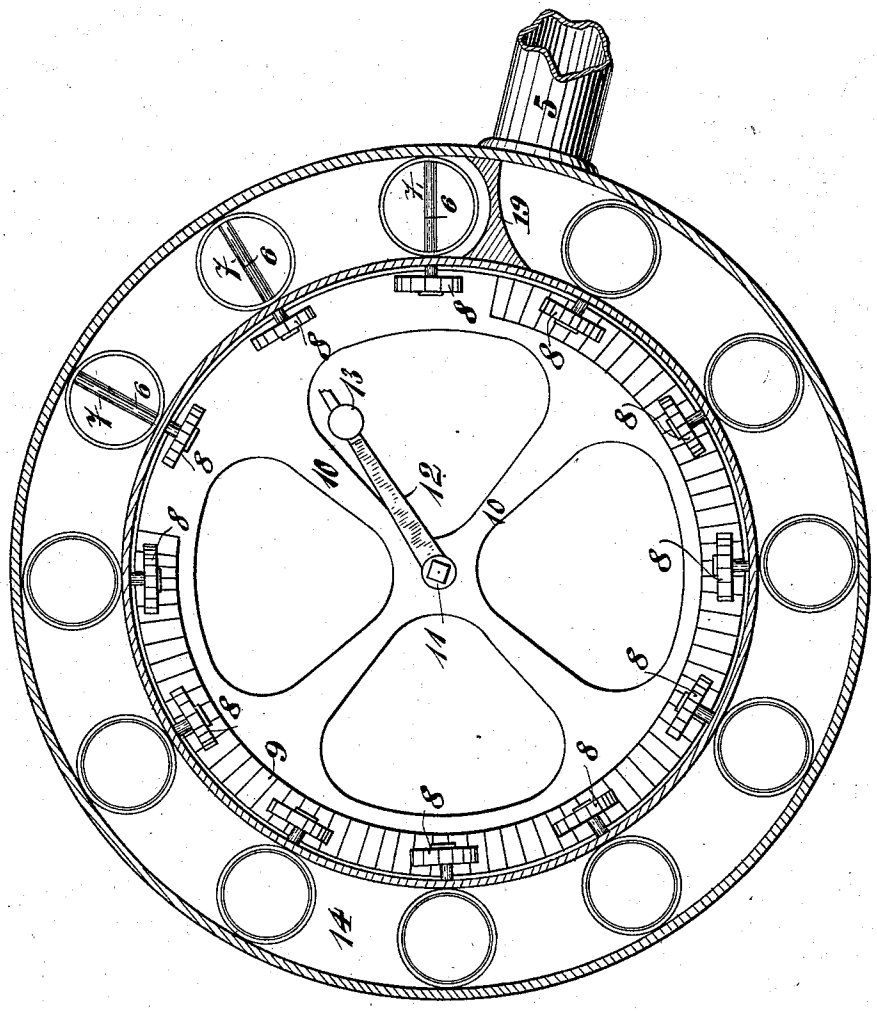
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Fig. 8.



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UNITED STATES PATENT OFFICE.

EMILE DE MEULEMEESTER, OF BRUSSELS, BELGIUM.

APPARATUS FOR THE RECEPTION OF SOUND-SIGNALS FOR NAUTICAL PURPOSES.

SPECIFICATION forming part of Letters Patent No. 701,166, dated May 27, 1902.

Application filed September 28, 1901. Serial No. 76,949. (No model.)

To all whom it may concern:

Be it known that I, EMILE DE MEULEMEESTER, a subject of the King of Belgium, residing at No. 62 Rue de Neuchatel, Brussels, Belgium, have invented a certain new and useful Apparatus for the Reception of Sound-Signals for Nautical and other Purposes, of which the following is a specification.

The subject of my invention is an apparatus for the reception of sound-signals, consisting, essentially, of a sound collector and indicator connected by tubes to a series of ear-trumpets suitably located and arranged to receive the sounds. The said sound-collector has the form of a tubular ring and is provided with suitable earpieces for the attendant in charge of the apparatus and with a mechanism located within the tubular ring by the aid of which the operator can either open or close all the tubes connecting the collector with the trumpets or one or more of the said tubes at a time. When one tube only (or two or three adjacent tubes) is either closed or opened, a needle forming part of the mechanism indicates on a dial fitted to the collector the position of the said tube (or tubes) and of the trumpet by which the sound has been received. The said sound-collector may be connected electrically with a second indicator located at a distance therefrom and whose needle is made to follow the same movements as that of the first indicator.

The accompanying drawings represent, by way of example, apparatus constructed according to my invention.

Figure 1 is a side view of a crown of twelve trumpets placed around a mast and constituting a receiver. Fig. 2 is a plan view thereof. Fig. 3 is a side view of the indicating apparatus with the tubes connecting it to the receiver. Fig. 4 is a front view thereof. Fig. 5 is a plan of a second indicator apparatus connected electrically to the apparatus of Figs. 3 and 4. Fig. 6 is a view, on a larger scale in front elevation, partly in section, showing the detail of the working mechanism of an indicator suitable for determining the origin of sounds by closing the tubes through which they are conveyed into the apparatus. Fig. 7 shows a vertical section along the line A B, Fig. 6; and Fig. 8 is a view similar to Fig. 6, showing the arrangement of the mechanism of an indicator suitable for receiving messages or sound-signals by opening only the tubes through which the sounds are conveyed into the apparatus.

The same reference-figures indicate corresponding parts in all the figures.

1 1 1 are receiving-trumpets, which in the example represented, form a crown around a mast 2. 3 3 3 are acoustic tubes which connect these trumpets to the tubular ring 4 of the indicating apparatus.

5 5 are tubes fitted with earpieces for the operator.

6 6 6 are plugs or interrupters fitted to the extremities of the tubes 3 in the indicator apparatus. In the example represented these interrupters consist of disks of felt, rubber, or similar material pivoting on axes 7 7, journaled into the sides of the tubes across which they extend. Upon the inside ends of the axles 7 are fitted toothed wheels 8 8 8, which can gear with a rack 9, occupying the quarter of the circumference of a disk 10, mounted on an axle 11, fixed at the center of the tubular ring 4. Upon the end of the front part of the axle 11 there is mounted a needle 12, provided with a button 13, by the aid of which the operator can make it turn around the dial 14 of the indicator apparatus, which has figures at the places corresponding to the orifices of the tubes 3 in the tubular ring 4. The needle 12 in turning turns the axle 11 and the rack-disk 10.

In the form of apparatus shown in Figs. 6 and 7 the number of the teeth of the rack 9 and the wheels 8 are calculated, so that the axles 7 hold all the interrupters 6 open when their wheels 8 are not engaged with the rack 9 and when the interrupters 6 of the three wheels, which are geared all together with the rack 9, are shut, as shown at Fig. 6, when the needle 12 is brought upon the dial parallel to the axle 7 of the wheel which is in the middle of the three wheels; but these three interrupters are equally open when the needle 12 is brought to an equal distance from two of the axles 7, whose wheels are engaged with the rack 9, which allows all the interrupters of the apparatus to be opened at once. When a

second indicator is employed, reproducing the indications of the first at another part of the ship, these two apparatus may be advantageously connected together like former dial-telegraphs were, as is shown at Figs. 4 and 5. The indicator Fig. 4 then constitutes the manipulator and the indicator Fig. 5 the receiver. This system of telegraph being well known and not forming in itself a part of my invention, I shall not give a description, which may be found in every book on physics.

15, Fig. 5, is the needle of the second indicator, which reproduces on a dial 16 the indications of the needle 12 of the principal indicator.

17 represents a compass combined with the second indicator, so that the direction of the sounds registered by the needle of the indicator may be rapidly determined. In the same way a compass may be combined with the principal indicator, which in this case is arranged horizontally instead of vertically, as in the example represented.

When using the apparatus, the operator places the needle so as to hold all the tubes open and applies the earpieces to his ears. When he catches the sound of a syren or other signal, he causes the needle 12 to turn around the dial until the sound is intercepted by the closing of the tubes which receive it. He then stops the needle and notes the direction indicated by the needle of the apparatus, or if his apparatus is connected to a similar apparatus in view of the commander of the ship he warns the latter by a bell, for instance. He then replaces the needle, so as to again open all the tubes, and after some time if the sound detected is continued or when he again hears the sound, if it be an intermittent one, he again causes the needle to turn until the sound is intercepted, and again he notes the direction indicated by the needle, or rings his bell. By transferring to the compass the indications furnished successively by the apparatus it is easy to discover the source of the signal detected and eventually of the direction taken by the ship from whence it comes, so that the ship provided with this apparatus may be steered so as to avoid a collision or stranding.

In the form of apparatus shown at Fig. 8 in place of the rack 9 occupying a quarter of the circumference of the disk 10 it occupies three-quarters thereof and the needle 12 occupies the middle of the non-toothed space lying between the two extremities of the rack. It follows, then, that when this needle 12 is brought parallel to the axle 7 of one of the stops or interrupters 6 this interrupter and the two adjacent interrupters will be open, while all the others will be shut. On the other hand, when the needle 12 is brought to an equal distance from two of the axles 7 the interrupters which were closed are also opened, so that all the interrupters—that is to say, all the tubes—are open at once.

In order to determine the origin of a sound when all the tubes are open, the operator will turn the needle until he has found the group of three adjacent tubes, which should remain open for him to perceive the sound clearly, and he will keep these three tubes open as long as he wishes to remain in communication with the place from whence the sound has been emitted.

In order to render the perception of the sounds received in the apparatus more clear, I employ a single tube 5, fitted with one or two earpieces, and in the tubular ring 4 I provide a partition 19, preferably forming the prolongation of one of the walls of the tube of the listener 5. This partition directs all the sounds into the listener and prevents them circulating around the tubular ring 4. The partition 19 may advantageously be applied also to the form of apparatus shown in Figs. 6 and 7.

The arrangement and construction of parts of my apparatus, as well as the means of transmitting the indications from one apparatus to another, may obviously be modified without departing from the nature of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An apparatus for the reception of sound-signals characterized by the combination of a tubular ring, a tube provided with an earpiece fitted to said tubular ring, a series of ear-trumpets arranged to receive the sonorous waves, a series of tubes connecting the ear-trumpets with the tubular ring and means for closing and opening the said tubes.

2. An apparatus for the reception of sound-signals characterized by the combination of a tubular ring, a tube provided with an earpiece fitted to said tubular ring, a series of ear-trumpets arranged to receive the sonorous waves, a series of tubes connecting the ear-trumpets with the tubular ring the orifices of said tubes being arranged around the ring in order corresponding with the position of the ear-trumpets, plugs or interrupters fitted to the said tubes, means for opening and closing the said plugs or interrupters and a needle for indicating a tube through which a sound enters the tubular ring.

3. In apparatus for the reception of sound-signals the combination with a tubular ring, a tube provided with an earpiece fitted to said tubular ring, a series of sound-receiving trumpets and a series of tubes connecting the ear-trumpets with the tubular ring, of interrupters fitted to the said tubes, toothed wheels mounted on the axles of said interrupters and whose rotation produces the opening and shutting of the said interrupters, a rotatable disk provided upon a part of its circumference with teeth which can gear with the said toothed wheels for turning them, and a needle mounted upon the axle which carries the said disk

in such manner that when it is made to turn around the said axle it turns the axle and the disk.

4. In apparatus for the reception of sound-signals in combination, a tubular ring provided with an internal partition, a tube provided with an earpiece fitted to the said tubular ring, a series of sound-receiving trumpets, tubes connecting the said trumpets with the said tubular ring and means for closing successively one or more of the said tubes at a time.

In witness whereof I have hereunto set my hand in presence of two witnesses.

EMILE DE MEULEMEESTER.

Witnesses:

J. V. KIRKPATRICK,

H. E. E. KIRKPATRICK.