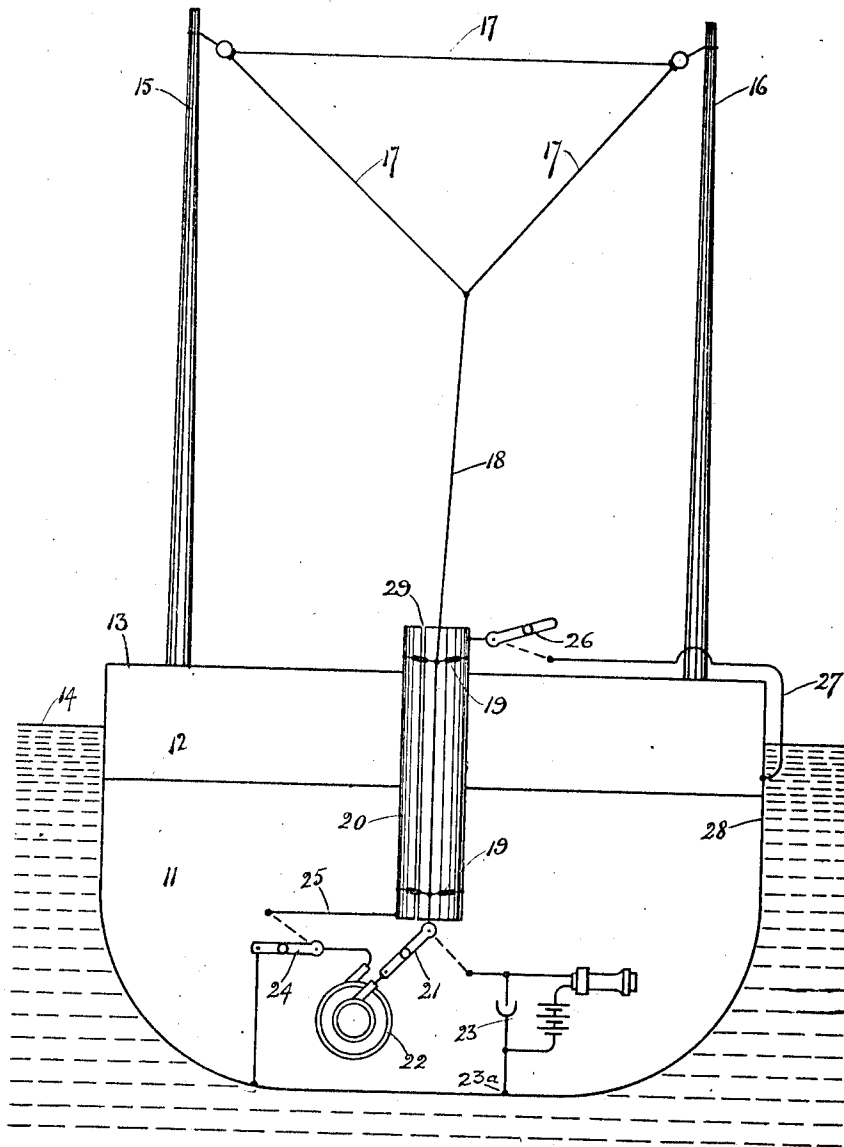


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WIRELESS TELEGRAPHY.
APPLICATION FILED JULY 19, 1909.

1,035,334.

Patented Aug. 13, 1912.



WITNESSES:
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WIRELESS TELEGRAPHY.

1,035,334.

Specification of Letters Patent. Patented Aug. 13, 1912.

Application filed July 19, 1909. Serial No. 508,442.

To all whom it may concern:

Be it known that I, REGINALD A. FESSENDEN, a citizen of the United States, residing at Brant Rock, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Wireless Telegraphy, of which the following is a specification.

My invention relates to the art of transmitting energy by electrical oscillations and more particularly to wireless telegraphy, and its primary object is the more efficient transmission and receipt of energy by electrical oscillations and more particularly the prevention of loss from absorption and shielding in transmitting and receiving signals by wireless telegraphy.

In the accompanying drawing forming a part of this specification the figure shows a sectional view illustrating apparatus for accomplishing the purpose of my invention.

This invention is particularly adapted for use where it is desired to locate wireless apparatus within an inclosure having walls of iron or similar material and especially on board battleships where it is desired to locate the wireless apparatus below the protective deck. Heretofore this has been found impossible, the signals produced and received when the apparatus is placed below the protective deck on war vessels or in a similar situation on other vessels being rendered so weak as to prevent satisfactory working over any considerable distance. As the result of numerous investigations I have discovered that this weakening is probably due to hysteresis or eddy-current losses set up in the steel decks or passages through which the wireless leads pass. I have determined by experiment that merely bringing a wireless lead within a few feet from a steel plate for a range five or ten feet has a very considerable effect on weakening the signals. As the result of numerous additional experiments I have discovered that this weakening can be overcome by surrounding the leads with a tube of conducting material, integral or slotted, which tube is preferably formed of copper or silicon bronze and surrounds the antenna lead or any of the other wireless conductors where they pass through a steel wall or in proximity to a wall of steel or similar absorbing material.

In the figure 11 is a compartment of a ves-

sel, 12 being the protective deck and 13 an upper deck.

14 is the water line, 15, 16 are masts for supporting the antenna, 17, 17, 17 is an antenna formed of a number of parallel wires arranged in the shape of an inverted triangle.

18 is the lead from the antenna.

22 is a high frequency dynamo and 23 is a receiver.

21 is a switch for connecting the lead 18 either to the high frequency dynamo or to the receiver.

20 is a tube of copper, for example two feet in diameter, which may be integral or slotted as shown for example at 29.

19, 19 are insulators supporting the lead 18 in the center of the tube 20.

The wireless apparatus may be grounded directly to the frame of the ship as shown at 23 or a switch may be employed as shown at 24 by which the apparatus may be connected either directly to the frame of the ship or to some conductor running through the walls of the vessel, for example to the copper tube 20 by the lead 25 as shown. The copper tube 20 is also preferably arranged as shown, so that by the throwing of the switch 26 it may be connected to a copper tube 27 which runs over the outside of the vessel and is connected to the copper sheathing on the outside of the vessel as shown at 28.

I have experimentally found that by the use of this invention the difficulties heretofore met with are overcome and the signals are transmitted and received with practically their full intensity. The tuning which was formerly very poor, when the apparatus was located below a steel deck, is by this invention rendered extremely sharp. As an illustration the U. S. S. *Connecticut* lying in the Brooklyn Navy Yard was able to receive signals from Brant Rock, Massachusetts, at practically undiminished strength, while at the same time entirely cutting out the disturbing signals from the station at the Brooklyn Navy Yard so that they could not be heard at all.

Having thus described my invention and illustrated its use, I claim as new and desire to protect by Letters Patent the following:

1. The combination with wireless tele-

raphy apparatus, and an inclosure for said apparatus made of energy absorbing material, of a protecting sheath between the conductors of the apparatus and the energy
5 absorbing material composed of a non-absorbing conductor.

2. The combination with an iron battleship or like inclosure of apparatus for wireless signaling including a conductor entering said inclosure, and a shield of non-absorbing conductor material around said
10 conductor where it passes through or is in proximity to the iron of the ship.

3. The combination with an iron ship or

like inclosure, of wireless signaling apparatus inclosed therein, an outside antenna and a lead between it and the said inclosed apparatus, and a copper sheath surrounding the said lead where it passes through the
walls of the inclosure. 15

In testimony whereof, I have hereunder signed my name in the presence of the two
subscribed witnesses. 20

REGINALD A. FESSENDEN.

Witnesses:

JESSIE E. BENT,

FLORENCE M. LYON.