

July 3, 1945.

H. A. D. LINDSEY
ANTISUBMARINE DEVICE
Filed March 19, 1942

2,379,447

Fig. 2.

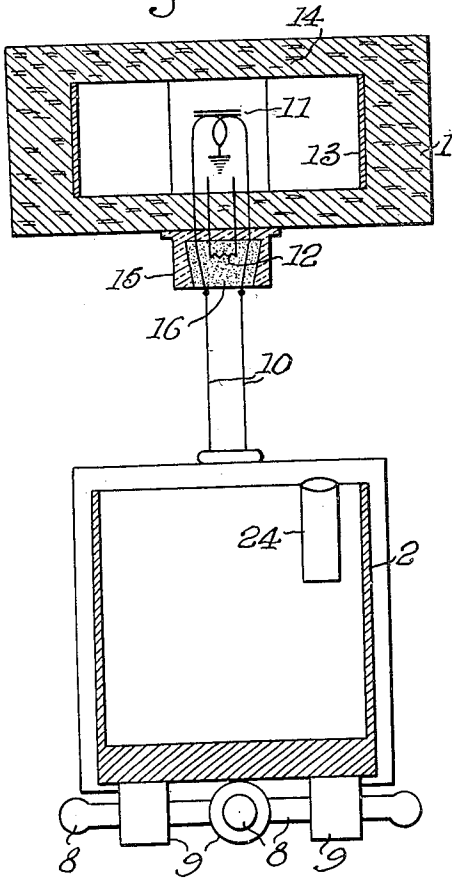


Fig. 1.

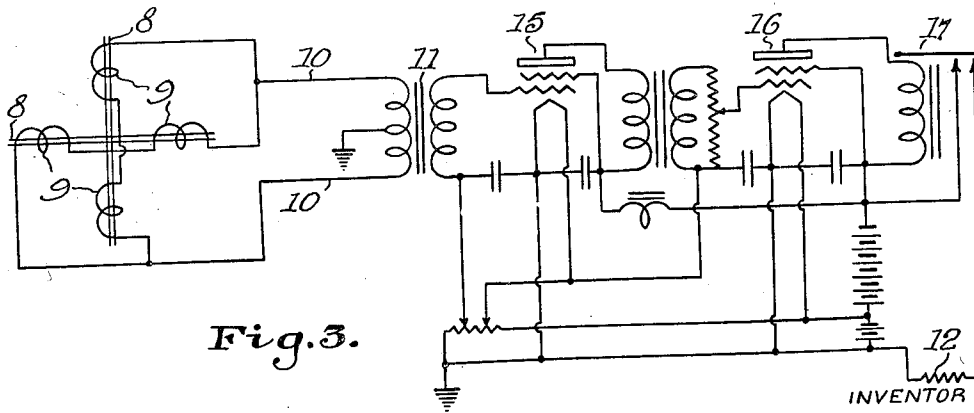
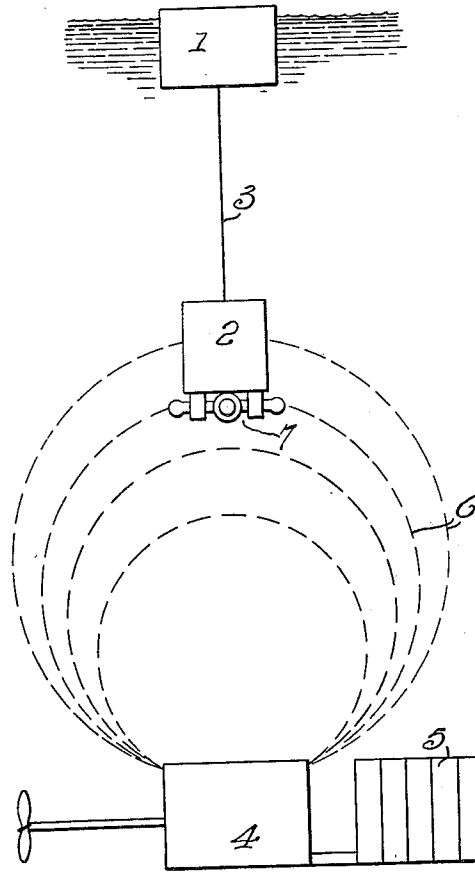


Fig. 3.

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UNITED STATES PATENT OFFICE

2,379,447

ANTISUBMARINE DEVICE

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Application March 19, 1942, Serial No. 435,263

7 Claims. (Cl. 102—10)

(Granted under the act of March 3, 1883, as
amended April 30, 1928; 370 O. G. 757)

The invention described herein may be manufactured and used by or for the Government for governmental purposes, without the payment to me of any royalty thereon.

This invention relates to anti-submarine devices, and more particularly to a device for simplifying the destruction of enemy submarines.

It is an object of this invention to actuate a submarine mine by picking up the electromagnetic flux created by the motor or battery charger of the submarine.

Another object of this invention is to afford means whereby mines may be scattered over any area without endangering surface ships or vessels.

Still another object of this invention is to provide a mine which cannot be set off by gun fire or easily swept away.

These and other objects of my invention will become apparent upon a consideration of the following detailed description when taken in conjunction with the accompanying drawing, in which—

Fig. 1 is a diagrammatic representation of a mine embodying the principles of the invention;

Fig. 2 is a cross-sectional view of the mine and float; and

Fig. 3 is a schematic diagram of the actuating mechanism.

Referring more particularly to Fig. 1, it will be seen that I have provided a float 1 connected by a cable 3 to a mine 2. The submarine is represented generally by the numeral 5. The electromagnetic field of the motor 4 of the submarine 5 creates electromagnetic flux radiations or disturbance about the submarine as represented by the numeral 6. A magnetic pickup device 7 located on or near the mine is utilized as a means for detecting the presence of the submarine 5 when it is operating below the surface of a body of water in the near vicinity of the mine 2.

The construction of the float and mine will be clear upon a consideration of Fig. 2. The magnetic pickup device 7 consists of two crossed magnetic poles 8 about which are placed the balanced coils 9. Lead wires or conductors 10, which may form the cable 3, lead from the mine to the float where they connect to a balanced transformer 11. A filament or fuse wire 12 is provided to detonate an explosive charge 16 placed in a connector 15. The connector 15 is attached to the float and is so arranged that, upon detonation of the charge 16, the cable and its attached mine will be released and will start to sink to a predetermined depth. At such depth the pressure will cause the hydrostatically controlled detonator 24 to explode the mine 2, causing violent pressure disturbances that will destroy a submarine operating in the

vicinity. The float 1 is constructed of a light material 14, such as balsa or cork, and is provided with an inner lining 13 of metal to cause it to sink to a sufficient depth so that it will be relatively unobservable from the surface.

The electrical operation is shown in Fig. 3. The output of the balanced transformer 11 is fed into a class B amplifier consisting of two or more tubes 15 and 16. The output of the final tube is fed to a sensitive relay 17. By utilizing Class B operation, there will result a minimum drain on the batteries and therefore longer life. When the submarine 5 is operating below water in the vicinity of the magnetic pickup device 7, the electromagnetic flux radiations 6 created by the magnetic field of the electrical equipment of the submarine 5 such as the motor 4 thereof, causes electrical impulses to be imparted to the coils 9 and producing an extremely weak alternating current therein, which weak alternating current is carried by the lead wires or conductors 10 to the balanced transformer 11, thereby causing the transformer to become unbalanced, which in turn causes a current to flow in the amplifying circuit. This amplified current actuates the relay 17 and will cause the batteries to be directly short-circuited by the filament 12. The entire battery current flowing through the filament 12 will cause it to reach incandescence and thereby detonate the charge 16.

It will be clear from the above that I have provided a simple mine which operates on the principle of the detection of an electromagnetic field rather than the mere detection of a mass of iron.

While I have illustrated a particular embodiment of my invention, it is to be understood that I do not wish to be limited to the particular details and arrangement disclosed since various modifications within the spirit of the invention will suggest themselves to one skilled in the art.

Having described my invention, what I claim as new and wish to secure by Letters Patent is:

1. A device of the character described comprising a float, an explosive charge carried by said float, a radiant energy amplifier including detonating means in engagement with said explosive charge, said detonating means connected to become active to explode said charge upon a current flowing in said amplifier, a mine suspended from said float and connected to be released therefrom by said explosive charge, means for producing a current in said amplifier, whereby said detonating means will explode said charge for releasing said mine from said float and means for detonating said mine upon being released from said float.

2. A device of the character described comprising a float, an explosive charge carried by said

float, a radiant energy amplifier provided in said float and including a source of electrical energy and a filament, said filament engaging said explosive charge, means adapted to be actuated for connecting said filament in circuit with said source of electrical energy, said means arranged to be actuated upon a current flowing in said amplifier, a mine suspended from said float and adapted to be released therefrom by said explosive charge, means responsive to external electromagnetic radiations for producing a current in said amplifier, whereby said first-mentioned means is actuated to connect said filament in circuit with said source of electrical energy, thus causing said filament to become incandescent for exploding said charge and releasing said mine from said float.

3. A device of the character described comprising a float, an explosive charge carried by said float, a radiant energy amplifier provided in said float and including a source of electrical energy and a filament, said filament engaging said explosive charge, means adapted to be actuated for connecting said filament in circuit with said source of electrical energy, said means arranged to be actuated by a current flowing in said amplifier, a mine suspended from said float and adapted to be released therefrom by said explosive charge, a pickup unit supported on said mine, means connecting said unit to said amplifier, said unit being responsive to external electromagnetic radiations for producing a current in said amplifier, whereby said first-mentioned means is actuated to connect said filament in circuit with said source of electrical energy, thus causing said filament to become incandescent for exploding said explosive charge and releasing the mine from said float.

4. In a device of the character described adapted to be placed in a body of water and acted on by electromagnetic radiations produced by the electrical equipment of a submerged submarine comprising in combination a float, an explosive charge carried by said float, a mine suspended from and connected to be released from said float by said explosive charge, a pickup unit consisting of electrical circuit means including a portion mounted in said float and a portion mounted on said mine, conductors connecting said portions together and providing means for suspending said mine from the float, said first-mentioned portion including a filament connected to become incandescent upon a current flowing through said electrical circuit means, and arranged to ignite said explosive charge and said second-mentioned portion including a magnetic induction device adapted to be acted on by said electromagnetic radiations for inducing a current in said electrical circuit, means whereby said filament is caused to become incandescent for exploding said charge to release the mine from said float and means for detonating said mine.

5. In a device of the character described adapted to be placed in a body of water and acted on by electromagnetic radiations produced by the electrical equipment of a submarine comprising in combination a float, an explosive charge carried by said float, a mine suspended from and connected to be released from said float by said explosive charge, a pickup unit consisting of electrical circuit means including a portion mounted in said float and a portion mounted on said mine, conductors connecting said portions together and providing means for suspending said mine from

the float, said first-mentioned portion including detonating means engaging said explosive charge and connected to become active by said electrical circuit means upon a current flowing therein and said second-mentioned portion including a magnetic induction device adapted to be acted upon by said electromagnetic radiations for inducing a current in said electrical circuit means, whereby said detonating means is caused to become active to explode said charge to release said mine from the float and means for detonating said mine.

6. In a device of the character described adapted to be placed in a body of water and acted on by electromagnetic radiations produced by the electrical equipment of a submarine comprising in combination a float, an explosive charge carried by said float, a mine suspended from and adapted to be released from said float by said explosive charge, a pickup unit consisting of electrical circuit means including a portion mounted on said float and a portion mounted on said mine, conductors connecting said portions together and providing means for suspending said mine from said float, said first-mentioned portion including a source of electrical energy, detonating means arranged to explode said charge and adapted to be connected in circuit with said source of electrical energy, upon a current flowing in said electrical circuit means, switch means adapted to be actuated by said electrical circuit means upon a current flowing therein for connecting said detonating means in circuit with said source of electrical energy and said second-mentioned portion including a magnetic induction device adapted to be acted upon by said electromagnetic radiations for inducing a current in said electrical circuit means, whereby said switch means is actuated to connect said detonating means in circuit with said source of electrical energy for exploding said charge and releasing said float from said mine and means for exploding said mine.

7. In a device of the character described adapted to be placed in a body of water and acted on by the electromagnetic equipment of a submarine comprising in combination a float, an explosive charge carried by said float, a mine suspended from and connected to be released from said float by said explosive charge, a pickup unit including a portion mounted on said float and a portion mounted on said mine, said first-mentioned portion consisting of a radiant energy amplifier including a battery, a filament adapted to be connected in circuit with said battery, and engaging said explosive charge, a balanced transformer and a switch adapted to be actuated by said amplifier upon a current flowing therein for connecting said filament in circuit with said battery and said second-mentioned portion consisting of a magnetic induction device and an input circuit including conductors connecting said magnetic induction device with said transformer, said magnetic induction device adapted to be acted upon by said electromagnetic radiations for inducing a current in said input circuit and unbalancing said transformer, whereby a current is caused to flow in said amplifier for actuating said switch to connect said battery in circuit with said filament thus causing said filament to become incandescent and exploding said charge for releasing said mine from said float and means for exploding said mine upon being released from said float.

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