C. MARSHALL.

MAGNETIC CONTROLLING DEVICE.

APPLICATION FILED OCT. 16, 1917.

1,388,658.

Patented Aug. 23, 1921.

2 SHEETS—SHEET 1.

Fig. 1.

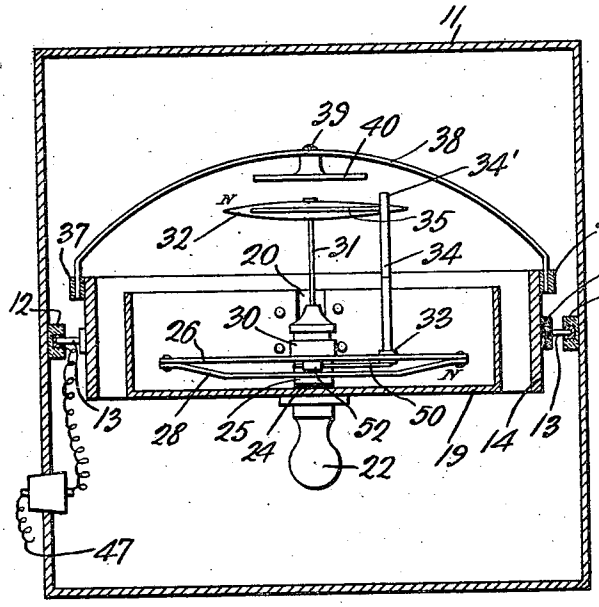


Fig. 3.

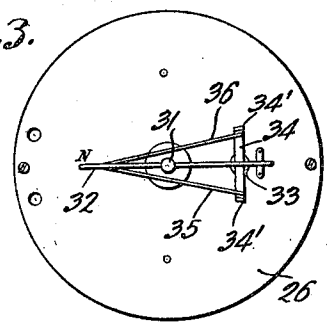


Fig. 4.

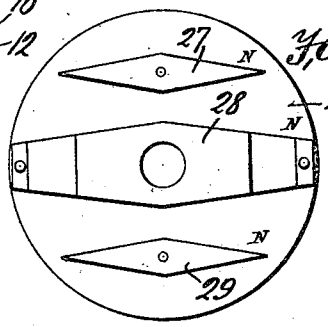


Fig. 5.

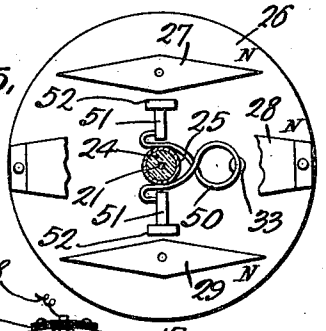


Fig. 2.

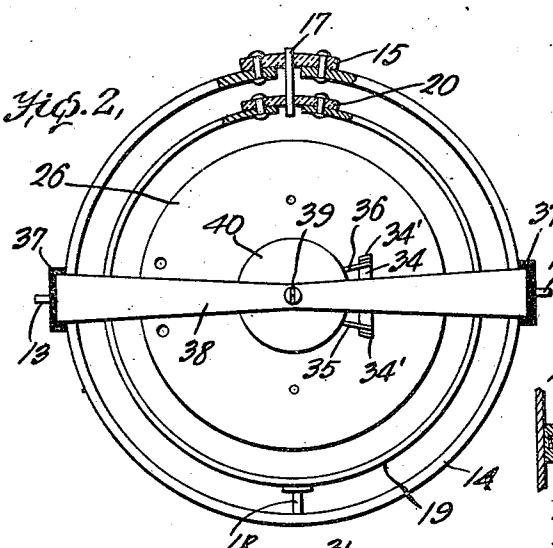


Fig. 6.

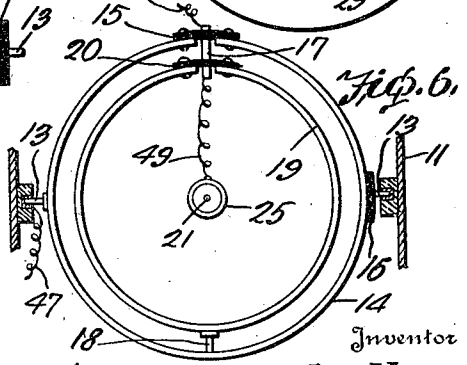
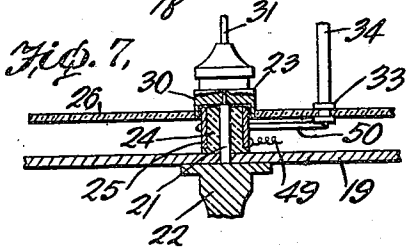


Fig. 7.



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2 SHEETS—SHEET 2.

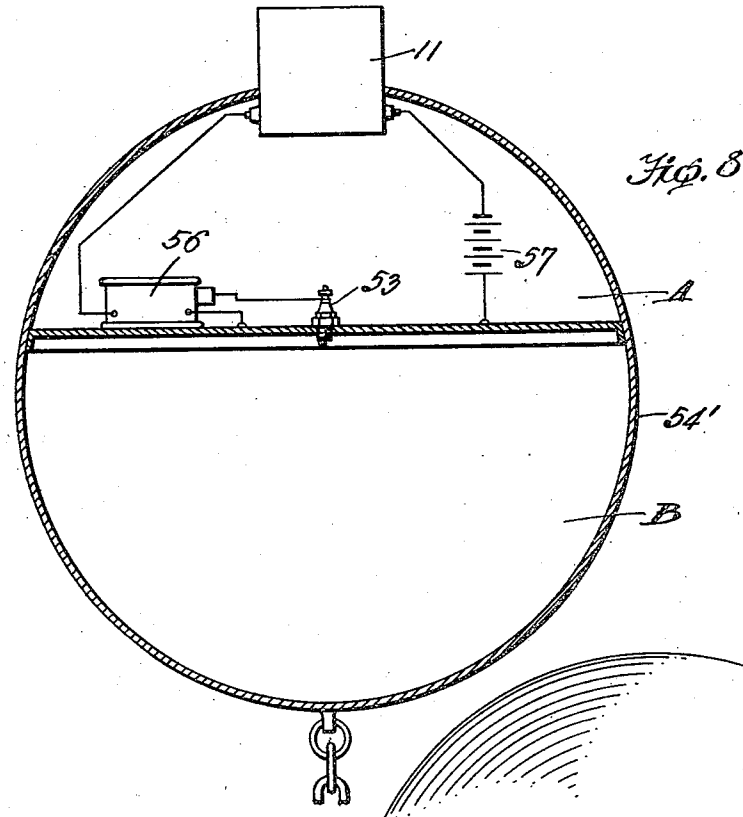


Fig. 8.

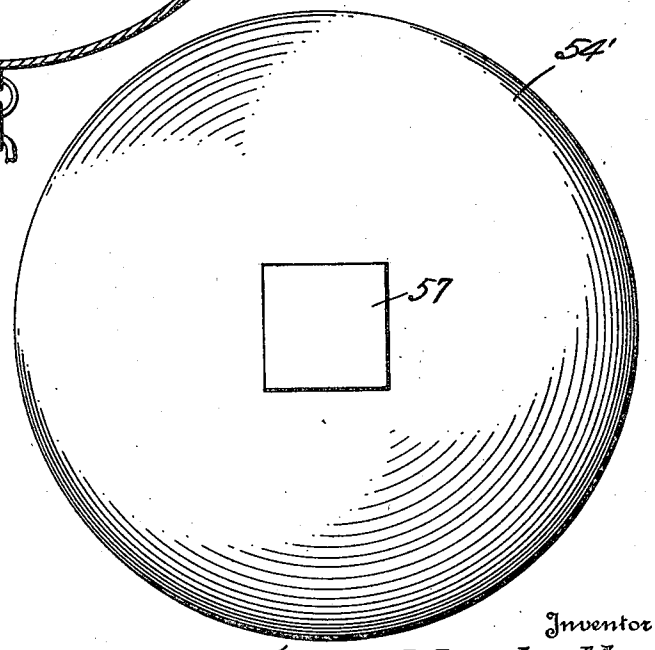


Fig. 9.

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UNITED STATES PATENT OFFICE.

CESAR MARSHALL, OF NEW YORK, N. Y.

MAGNETIC CONTROLLING DEVICE.

1,388,658. Specification of Letters Patent. Patented Aug. 23, 1921.

Application filed October 16, 1917. Serial No. 196,833.

To all whom it may concern:

Be it known that I, CESAR MARSHALL, a citizen of the Republic of Argentine, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Magnetic Controlling Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in magnetic controlling devices, and is adapted for use in connection with submarine mines, indicating mechanism for ships at sea, and indicating mechanism for coast defense, wherein the passage thereby of a metallic vessel within certain distances will cause the actuation of the magnetic switch to close a circuit to operate an indicating mechanism or ignite an explosive.

A further object of this invention is the provision of a device of this character which is readily placed in use, and which when used in connection with indicating mechanisms, will operate any number of times without being destroyed, but which when operated in conjunction with a submarine mine, will itself be destroyed.

When used in conjunction with coast defense, the apparatus is designed to be submerged at any desired distance from the shore and along the sea coast, so that any vessels passing thereby, either submerged or otherwise, will cause the actuation of an indicating mechanism upon the shore, either in a fort or signaling tower, thus giving the exact location of such vessel, and rendering it possible, in case there should be an enemy's submarine, to pursue or capture such vessel, or to warn a friendly vessel of the presence of such enemy's vessel.

In the accompanying drawings:—

Figure 1 is a cross section through the hermetically sealed casing of the magnetic member showing the normal position of the various parts of the magnetically controlled switch.

Fig. 2 is a top plan view of the ebonite disk carrying the upper magnetic needle and the bow.

Fig. 3 is a top plan view of the ebonite disk carrying the upper magnetic needle.

Fig. 4 is a reverse view of the same showing the lower permanent magnets.

Fig. 5 is a similar view with the central magnet removed to show the electrical connections.

Fig. 6 is a diagrammatic view showing the method of connecting electrically the main receptacle member and the axis portion thereof.

Fig. 7 is a diagrammatic and sectional view showing the present apparatus used in conjunction with a submarine mine.

Figs. 8 and 9 are detail views of parts of the present mechanism.

Referring to the drawings, and more particularly to Figs. 1 to 7, the numeral 11 designates the hermetically sealed, preferably brass, casing which has disposed therein the blocks 12 of insulation which carry the journals for the pivots 13 which in turn support the outer ring or annulus 14, which is also made of brass.

This ring is provided with the insulating connection 15, and is itself supported at one side by another insulating connection 16.

One pivot member 17 is mounted in the insulating member 15, and coöperates with the diametrically disposed pintle 18 to support the brass receptacle or disk 19, the first mentioned pintle 17 being journaled in the strip 20 of insulation, which constitutes a portion of the wall of the member 19.

Disposed co-axially of the member 19, and depending from its pole 21 is a counterbalance weight 22, which in turn has electrically connected thereto the pin or vertical shaft 23, the same being insulated by the insulation 24 from the metal sleeve 25.

Mounted for independent rotation upon the axis 23 and also about the metal sleeve 25, is an ebonite or other insulating material disk 26, which carries upon its under face the three parallel permanent magnets 27, 28 and 29.

The center magnet 28 is provided with an opening that fits over, but is out of contact with the sleeve 25, while mounted co-axially of the disk 26 is a hollow post 30 which embraces, but does not contact, the metal sleeve 25, contacting, however, the reduced end of the center axis 21. Carried upon the upper end of the post 30 is the support 31 for the upper magnetic needle 32.

Also carried by the disk 26 is a metal supporting plate 33 for the fork or Y-shaped member 34. The member is so disposed that the south pole of the magnet 32 is between the forks thereof, but normally pointing south, this action being due to the static power of the three controlling magnets, 27, 28 and 29.

Also carried by the magnetic needle 32 are the resilient circuit closing members 35 and 36, which, as will later appear, engage either one of the terminals 34′ of the member 34, and close the electrical circuit.

Supported through the medium of the blocks 37 of insulation is the bow 38 which carries at its top the securing screw 39 to support the limiting disk 40 which prevents the unseating of the support 31 and its needle 32 when the buoyant supporting member 41 is being transported or submerged, said disk limiting the vertical or longitudinal movement of these parts.

The circuit connections between the needle 32 and the respective conductors 47 and 48 is as follows:

The conductor 48 is connected to the pintle 17, which is insulated from the annulus 14 and also the disk 19, and has connected to its inner end the conductor 49 which in turn is in engagement with the sleeve 25, and as this sleeve 25 is embraced by the resilient conductor 50, connected in turn to the metal support 33 at the under side of the disk 26, current is led to the member 34.

The two conductors 50 are supported by the member 51 which is connected by insulating strips 52 to the disk 26. In this manner, the conductors 50 are insulated therefrom.

The negative conductor 47 is in electrical connection with the pintle 13, the annulus 14, the pintle 18, and the disk 19, its axis 23 being electrically connected thereto so that the support 31 of the magnet 32 is electrically connected thereto. Thus, it is evident that any movement of the needle 32 will bring either one of the contacts 35 or 36 into engagement with one of the terminals 34′ of the member 34 and cause the closure of the circuit.

As the three permanent magnets 27, 28, and 29 are of greater power than the magnetic needle 32, and as the poles of the magnets 27, 28, and 29 are so arranged that the north poles thereof normally project north, while the north pole of the magnet 32 normally projects south, a magnetic needle or switch controller is provided and in which the latitude of swing permitted the magnetic needle 32, due to the passage thereby of any magnetic metallic object, will be regulated by the distances of the outer magnets 27 and 29 relatively to the central magnet 28.

In practice, the effect of such passing body of metal will cause the terrestrial magnetism to act upon the magnetic needle 32, endeavoring to reverse the polarity thereof, the north pole thereof swinging toward the south pole, or either one of the outer magnets 27 and 29, and attempting to close the magnetic field thereof, the opposite pole being attracted in a similar manner to the opposite pole of the remaining magnet 27 or 28.

It is apparent that either one of the contacts 35 or 36 when moved in this manner will engage either one of the terminals 34′ of the member 34 and close the aforementioned circuit.

As shown in Fig. 8, the casing 11 is hermetically connected to the submarine mine 54′, so that the magnetic needle is disposed with its axis coaxially with that of the mine, while the said mine is divided into several chambers A and B for the electrical devices and the explosive, respectively.

In this instance, the spark plug 53 is grounded in the partition between the compartments, while mounted in the compartment A is the coil box 56 and the battery 57, so that all circuit connections are inclosed.

When setting these mines, wooden vessels are employed to anchor them in the desired places, the magnetic needle being so adjusted as to operate when a metallic vessel passes within a predetermined distance thereof.

Where the device is used as a defensive mine, there is connected in circuit with the battery the usual form of time clock which opens the circuit at predetermined periods, so that the proper authorities will know when the mine is rendered inoperative, and the passage of ships thereby is safe.

What I claim as new is:—

1. A circuit closer including a non-magnetic casing, a gimbal mounted in said casing and consisting of two members each insulated from the other and from the casing, a rotatable body carried by the inner member of the gimbal, said body being non-magnetic, a plurality of permanent magnets carried bodily thereby, said magnets being in parallel with their poles in the same direction, a vertical shaft carried axially of the rotatable member, a magnetic needle mounted for independent movement upon the upper end of said shaft with its north pole in an opposite direction to the north poles of the first mentioned magnets, a Y-shaped non-magnetic antenna carried by the rotatable body and disposed to have the terminals thereof fitting astride one end of the magnetic needle, contact members carried by the magnetic needle for engaging the antenna, said contact members being normally held out of contact with the antenna due to the magnetic effect on the first mentioned permanent magnets upon the magnetic needle, and circuit connections with the shaft and antenna and insulated from each other whereby the circuit is normally open.

2. A circuit closer including a non-magnetic supporting casing, a gimbal comprising two non-magnetic members mounted in said casing, a concentric support carried by the inner member of the gimbal, a rotating non-magnetic member mounted upon said support, a sleeve surrounding and insulated

from said support, a plurality of permanent magnets attached to the under side of the rotatable member and having their north poles in the same direction, a vertical pin carried by the rotatable member and having its lower end in vertical connection with the axial support, a magnetic needle mounted for independent movement upon the upper end of said pin with its north pole extended in the opposite direction of the north poles of the first permanent magnets, a Y-shaped antenna attached to the rotatable member and insulated therefrom and having its terminal disposed to fit astride and normally out of contact with the one end of the magnetic needle, a circuit connection leading from the lower end of the antenna to the middle sleeve, and circuit connections leading from the axial support whereby when the magnetic needle is in normal position the circuit is open.

In testimony whereof I affix my signature.

CESAR MARSHALL.