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H. GERNSBACK EDITOR
H. W. SECOR ASSOCIATE EDITOR

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Locating and Destroying Submarines with Red Light

A NEW method due to Yankee ingenuity and intended for locating submerged sub-sea boats at a considerable range has recently been worked out. It has been described by a retired naval officer and appears to have made a favorable impression on the navy's experts.

If once it becomes possible to locate the presence of an enemy submarine, then the greatest worry of cargo steamship captains will be over, for when the "sub's" location is spotted then the vessel's guns will be trained on the spot. As soon as the under-water boat comes to the surface to take her sightings she will be met with a hail of shot and shell.

The new method, holding great promise for the destruction of the submarine and its entire elimination as an efficient weapon of warfare is now being perfected, and it is probable that within a very few weeks vessels may navigate the high seas with safety, so far as submarine attacks are concerned.

As may be imagined, the experimenters in this field are not willing to make public the actual experiments, details and results accomplished, but the following outline of the method now under consideration will be of great interest to the public.

Inasmuch as the great advantage of the submarine over surface vessels is the fact that it is hidden from view, if by some means the exact location is made known to a vessel before she approaches within the danger range (2,000 to 2,500 yards) of the submarine, the menaced vessel can invariably escape.

In seeking methods to be employed for certain purposes, inventors and experimenters frequently turn to the five senses when beginning the solution of a baffling problem. We cannot feel, smell or taste a submarine over a mile distant, so we are left only two of the senses remaining—the sense of the eye and that of the ear.

The microphone enables us to hear more or less distinctly the engines of the submarine when they are working at more than slow speed, but this is not sufficient, as a submarine lying in wait to torpedo a vessel needs only to turn her engines over very slowly to maintain her depth below the surface.

A submarine vibrator operated by electricity has produced an echo from an iceberg two miles distant, but it is doubtful if the system can be improved to efficiency in the case of the submarine. Now let us consider our remaining sense: sight.

When our ship approaches the danger zone of the submarine the latter is maintaining a heading which is nearly at

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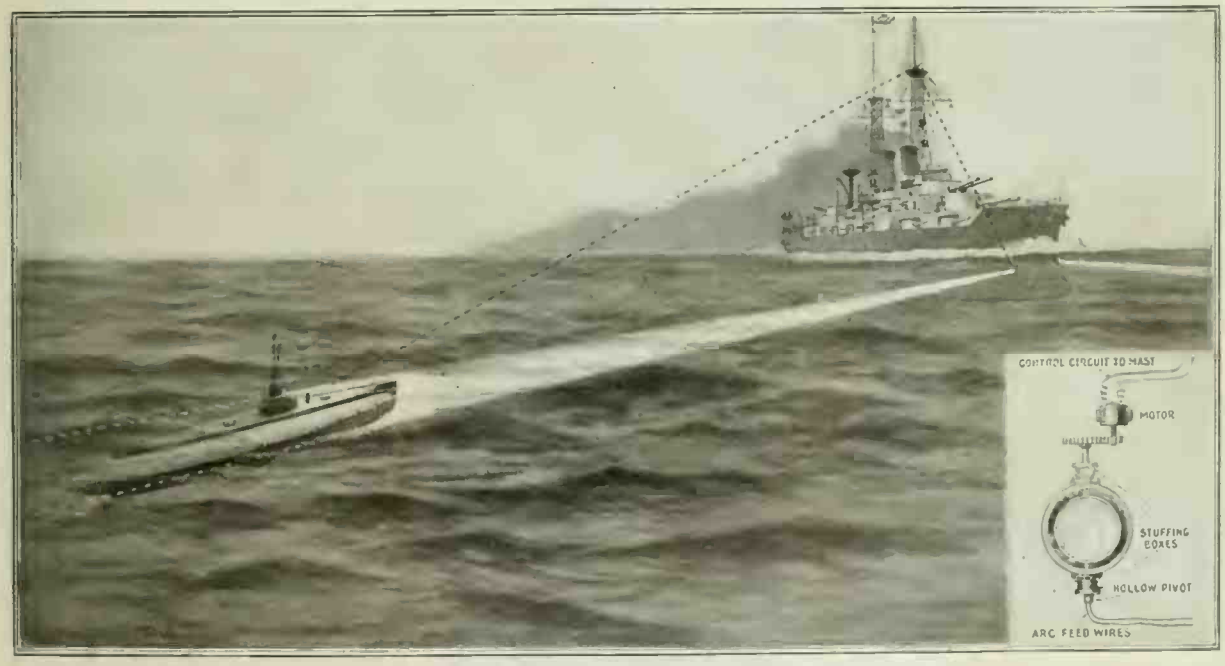

Why Not Locate the Submerged, Yet Always Dangerous, Enemy Submarines by Continually Flashing a Powerful Red Searchlight Beam Back and Forth Thru and Under the Water, Asks a Yankee Genius. Once a "Bulge" Is Spotted (Day or Night) in the Light Beam, the Observer on the Mast Signals That Fact to the Gun Crews. Consequence—as Soon as the Periscope Appears the Already Trained Guns Open Fire. The Spotting Range Is Over Two Miles, Day or Night.

B. SERGEANT, 1ST CLASS. The applicant must be—

(a) An expert telegrapher and have knowledge of the operation and maintenance of telegraph systems and batteries, or—

(b) An expert radio operator and have knowledge of radio apparatus, or—

(c) Have knowledge of telephone systems, switchboards, batteries, locating and correcting faults, etc., or—

(d) Possess such qualities as would fit him to act as leader of a platoon of a company of Signal troops.

C. SERGEANTS AND CORPORALS. The applicant must have general knowledge of the subjects given under B, or possess such qualities as would fit him to act as a leader of a platoon or section of a company of Signal troops.

D. PRIVATE, 1ST CLASS AND PRIVATE. The applicant must show an interest in the subjects mentioned, be competent, keen, and possess such qualities as will insure that he will develop along the proper lines in training.

Applicants for enlistment as Master Signal Electricians and Sergeants, First Class, will be given an oral examination. Applicants for enlistment in the other grades will demonstrate to the officer designated to obtain recruits that they have the necessary qualifications. Applicants for enlistment in the Eastern Department should present themselves at 39 Whitehall St. (near the Battery), New York City.

LOCATING AND DESTROYING SUBMARINES WITH A RED LIGHT RAY.

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right angles to our course and she is thus in a position, broadside, to an observer from our vessel; that is, the submarine is presenting the greatest surface of her hull to us and is in the most favorable position for the visibility from our vessel, if she can be rendered so by any means.

A searchlight operated from aloft on our ship has two defects which prevent it from being sucessfully used for this purpose as a submarine detector.

A submarine ready to fire a torpedo is submerged to a depth of some fifteen or twenty feet. A searchlight played over the water from aloft must not only find the horizontal angle of the submarine but the vertical angle as well, the area being too great to admit accomplishment of this object.

Moreover, the ray of light when striking the water, passing from a light medium (air) to the denser medium of water causes a glare, due to the refraction which forms an opaque cloud to the observer, obscuring everything beyond it.

There is too much daylight for the searchlight to be practical during the day, the time when attacks are made by submarines.

However, if we submerge our searchlight or, rather, its ray of light to a depth of fifteen feet by installing the searchlight in the vessel at this depth below the waterline, and flash a powerful beam of light, *red in color* thru a thick lens of glass in the ship's side and out into the water, we obtain several distinct advantages over the searchlight operated from aloft.

It is only necessary to revolve this light thru an approximate angle of 90 degrees on either side of the vessel to bring a lurking submarine into its path, for the ray is already in the proper horizontal plane beneath the surface of the water.

It is operating only in one medium, water, and the opaque glow is not formed. Its color in contrast to the green sea enables it to be seen in bright daylight as a slender reddish path extending some *two miles* out into the ocean just beneath the surface of the water.

An observer with a powerful telescope is stationed aloft, whose duty it is to observe vigilantly this tract of crimson as it sweeps slowly back and forth abreast of the ship.

Suddenly he presses a button, instantly arresting the revolution of the beam of light, for he has noted that the ray of light does not extend to its ordinary limit, while there is a glare of blurred light forming what may be termed a "bulge" in its path and he realizes instantly that the beam of light has encountered a non-transparent body which is refracting the ray.

The alarm is sounded and the gun battery trained on the spot indicated. One or two shots will destroy the menace and the vessel may divert her course to clear it.

All that is necessary to insure the success of this method is the perfection of a searchlight of sufficient power and an experienced observer.

The public may confidently anticipate the rapid development of this system of defence, which will prove not only a mortal blow to the submarine but a benefaction to all humanity. The device here described is easily adaptable to either naval or commercial ships and a vessel may conveniently carry four search-lights of this type—two forward and two aft; one on either side of the hull in both positions.

DOES RADIANT LIGHT POSSESS WEIGHT?

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mysteries. Briefly, he allowed a beam of light to fall on a suspended disc in a vacuum bulb, exhausted to the highest degree. In such a vacuum the disc was repelled on the impact of a light beam, and its repulsion was measured by its torsional effect on the suspending wire. This light-pressure at the distance of the earth from the sun is small, not quite a milligram per square metre of the earth's surface, or roughly, 70,000 *tons on the whole earth*. The light-pressure is applied only on the surface, and is proportional to the surface, while weight, or the pull of gravitation, affects the whole body. The adherents to the electro-magnetic wave theory of light have some difficulty in explaining this pressure, as it seems impossible to conceive of a mere wave-form in the ether exerting a material force or pressure on the earth. If light were considered a material substance, however, the above phenomenon could be more plausibly explained, as due to the effect of gravitation on a tangible substance.

There are many interesting facts to be obtained on the chemical and physical effects of light, and in respect to this side of the problem there are many opportunities for research work, which might result in the solution of the mystery as to the nature of light. Below are given a very few of the instances in which the elements are acted upon by the strange force of light: (1) Nitric acid is readily decomposed by light. (2) Silver chlorid, silver iodid and silver bromid are all chemically changed on exposure to light. (3) Silver nitrat in the presence of organic matter, looses its oxygen and is reduced to the metallic state by the action of light. (4) Mercuric oxid is decomposed by light. (5) The chlorids