

Locating and Destroying "Subs" with Electro-Magnets

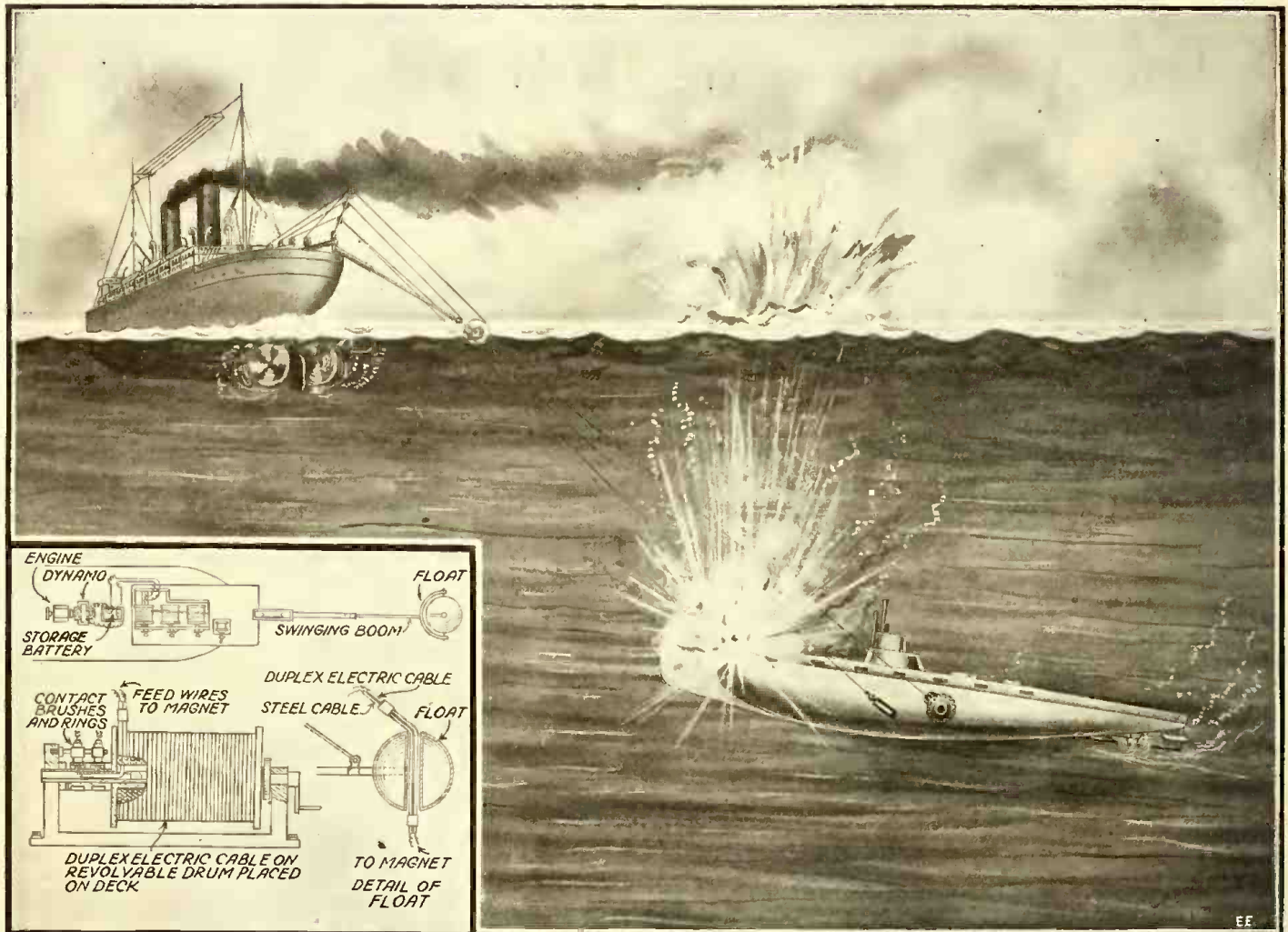
THERE'S one thing certain about this war anyway, and that is that there will be no falling off in the business of the patent office. Not if the Yankee inventors can help it, at any rate. For one thing they will be able to keep the patent examiners busy on anti-submarine devices for several years to come, apparently. We thought that the magnet schemes for combating the U-boat menace were about exhausted—we said "thought," but here's a new one. And it employs electro-magnets—oodles of them if necessary. The inventor of this newest magnetic "Sub"

thru the danger zone, so that a large area may be covered in a predetermined time. A substantial base is secured rigidly upon the aft deck of the vessel as shown in the illustration herewith. This base preferably extends beyond the line of the hull, as it is upon this base that most of the working parts of the device are mounted.

Pivoted at the rear end of the base is a rearwardly projecting, vertically swinging boom which is by preference extensible and retractable, set screws or clamps being provided for holding it in adjusted position. The rear end of the boom is forked as

at any suitable point on the ship, a generator being provided for charging the battery to the required extent. The generator may either be driven from the internal mechanism of the ship, or from an individual motor or engine.

The two cables attached to the electro-magnet are wound upon a drum suitably mounted upon the deck base, the anchored ends of the duplex electric feed cable, being past thru the hollow shaft of the drum and secured to a pair of contact rings which are insulated from the shaft, that is the two wires which comprise the feed cable, are



As a General Rule the "Magnet" Schemes Proposed for Combating Submarines Are Worthless. This One Possesses at Least Some Semblance to a Practical Idea. An Inventor Recently Patented the "Magnetic Bomb" Scheme Illustrated. The Vessel Using the Device Trawls the Powerful Electro-Magnet Astern; When Its Cable Pulls Taut the Crew Knows They Have Landed a Submerged "Sub." Extra Electric or Magnetic Depth Bombs Are Lowered into the Water, the Ship Moves Away a Suitable Distance, and the Rest Can Be Imagined.

destroyer is Mr. John A. Gault of Lancaster, Wisconsin, and the *modus operandi* of his arrangement is as follows:

The invention has for its object to provide efficient means whereby submarines may be located and destroyed, the invention consisting briefly of an electro-magnet, towed by means of a cable, beneath and in rear of a vessel, for locating submerged objects such as submarine vessels and mines, and means for lowering a bomb to destroy the submerged object when it is once entrapt by the magnet. The ship using this apparatus is preferably of the screw-driven type and driven as fast as practicable

shown, and a suitably shaped float is mounted pivotally in this fork, the float having formed there thru a guideway thru which a suitable steel cable and an electric wire cable pass slidably and at intervals are secured together by suitable clips, these clips being preferably disposed at predetermined points so that they may be provided with indicating members whereby the depth at which the magnet is located, may be readily determined, the magnet being carried by the lower end of the steel cable and supplied with electric current from the duplex electric cable. This current is supplied to the cable from a storage battery

secured to the brush rings. Suitable brushes contact with the rings, and current conducting wires lead from these brushes to the battery. It will thus be obvious that no matter how much the cables are wound or unwound, the current supply of the magnet will always be constant.

Any preferred means could be employed for raising and lowering the boom, but for illustrative purposes there is shown a special cable secured at its outer end to the free end of said boom, and wound at its other end on a winding drum mounted on the base.

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The circuit as here shown has been successfully used for several years by experimenters and others without the tickler coils, these being a new wrinkle, which tend to stabilize the oscillating conditions, once they are set up by tuning the various inductances and capacities. The condenser capacities are given. It is suitable for intercepting damped as well as undamped signals. The inductances are of the following dimensions:—primary of loose coupler is 10 by 5 inches, wound with No. 22 S. S. wire; the secondary is 10 by 4 1/4 inches, wound with No. 28 S. S. wire; the secondary loading coil SL measures 22 by 3 1/2 inches with one layer of No. 30 S. S. wire, while the wing inductance WI is the same size with a winding of one layer of No. 30 S. S. magnet wire.

Beat reception with Audion amplifier connections has been accomplished with great success by Prof. A. Hoyt Taylor in the radio laboratory at the University of North Dakota. In his circuit, which has proved sensitive enough to pick up the German stations 4,300 miles away; and shown diagrammatically at Fig. 9, use is made of two Audions, Nos. 1 and 2, both of which are chosen so as to be capable of generating oscillations. The 1 to 1 auto-transformer M (9,000 ohms) may be made from a spark coil secondary or a couple of them, thru which a soft iron wire core is past, and the whole sealed up in a tight cabinet filled with molten paraffin wax or sealing compound. This inductance M, allows current from the 35-volt battery to pass but stops high frequency or pulsatory current.

The stopping condensers SC, should be small, the second one being of about 0.5 billifarad (one billifarad = 1 millimicrofarad or 10⁻⁹ farad). The variable capacity C should not be above 4 billifarads, thus permitting L to be large. For very long waves an aerial with a length of 800 ft., was used; its average height was 75 ft., and its capacity 0.013 m. f. The circuit LC is slightly mistuned from the signals and the Audion filament heated somewhat above normal, when working this circuit. The beat note is thus greatly amplified when it reaches the high resistance telephone T. Prof. Taylor has done excellent work with this arrangement, hearing the German stations at Nauen (10,000 meters wave length). Eilvese (7,800 meters w. l.) and both the arc and the spark signals sent out from the station at Honolulu. T. H.

(To be continued)

LOCATING AND DESTROYING "SUBS" WITH MAGNETS.

(Continued from page 6)

In operation, a fleet of ships are supposed to travel abreast towing their respective electro-magnets, and the moment any one of these magnets come in the immediate vicinity of a submerged metallic object, it will be attracted to such an object. The magnet cables are then payed out to prevent any possibility of pulling the magnet from the object and in the meantime the ship may be brought to a standstill. In some instances the force of the powerful electro-magnet may be great enough to permit raising mines, by simply winding up the cables controlling the magnet and boom. In most cases, however, a bomb, which may itself be fitted with a self-contained magnet, and exciting means such as a battery, would be lowered to destroy the entrapped body. The inventor mentions that before exploding the bomb that the vessel should move off a safe distance to prevent injury to her hull, due to the terrific concussive waves transmitted by the explosion thru the water for a distance of several hundred feet at least, in most instances.

If the bomb lowered into the water for the purpose of destroying the enemy submarine or mine, is provided with a self-contained electro-magnet and battery as outlined above, then it is a simple matter for the vessel liberating it to steam away a considerable distance before the time fuse on the bomb detonates it.

NEW SPY AND SCIENTIFIC MOVIES.

(Continued from page 8)

as the subject as a proof of his love and faith. Overhearing her acceptance of Leslie's proposal, the now half-crazed Durand believes the time has come when he can execute his scheme of vengeance.

Before a large crowd of scientists and famous surgeons, Dr. Leslie is inoculated. Durand, stealing the key to the cabinet in which the precious serum is kept, destroys it, but in so doing inoculates himself by contact with a test tube containing the poison germs. The time arrives for Laurel to administer the serum and she discovers the theft from the cabinet. After trying frantically to get in communication with the Zoo, she dispatches her chauffeur with instructions to bring back the only other specimen of mascarine turtle in existence at all costs. Confronting Durand, she accuses him of the theft and he confesses. After an agonizing delay, the chauffeur returns with the turtle and Laurel is able to save Leslie from a terrible death.

Meanwhile, her husband arouses from a drunken stupor into which he has fallen and finds himself locked in a small room of the laboratory. By the time he is able to attract the attention of Laurel he has become seriously ill. Leslie insists that the girl give Durand the two remaining injections of the serum and Laurel is confronted with the choice of risking the life of the man she loves or saving his would-be murderer. Due to the fine vitality of the young physician, he fights a splendid battle with death and recovers, while Durand, whose health has been sapped by indiscretions of all kinds, dies. After the scathing fires of fate to which she has been subjected, Laurel finally emerges happy in the love of young Leslie and together they plan a life devoted to the serving of humanity and the true affection which they now realize they have always borne for each other.

YANKEE CODE NOT SO "BLOEDSINNIG."

(Continued from page 7)

it never materialized into anything big. It is really wonderful tho, to think that he could transmit speech a distance of one-half mile by simple induction. He used elevated wires connected at their upper ends to large condensers and at their lower ends to the earth. Thomas A. Edison also experimented with the electrostatic inductive system of wireless between a moving train and a "paralleling circuit" strung along the track on poles. The roof of the car was metal covered and the telephone apparatus was connected to it as well as to earth thru the car wheels. Success was attained with this system but it never became a commercial proposition.

ELECTRICITY AND METAL COATED SEEDS BOOST CROPS.

(Continued from page 9)

High frequency electricity produces a definite vibratory impulse that is doubtless the cardinal factor in increasing plant growth. The idea that the electricity primarily heats the ground is not a correct one. The heating may be incidental to other results, and