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How the Electric "Sea Tanks" Raided Pola

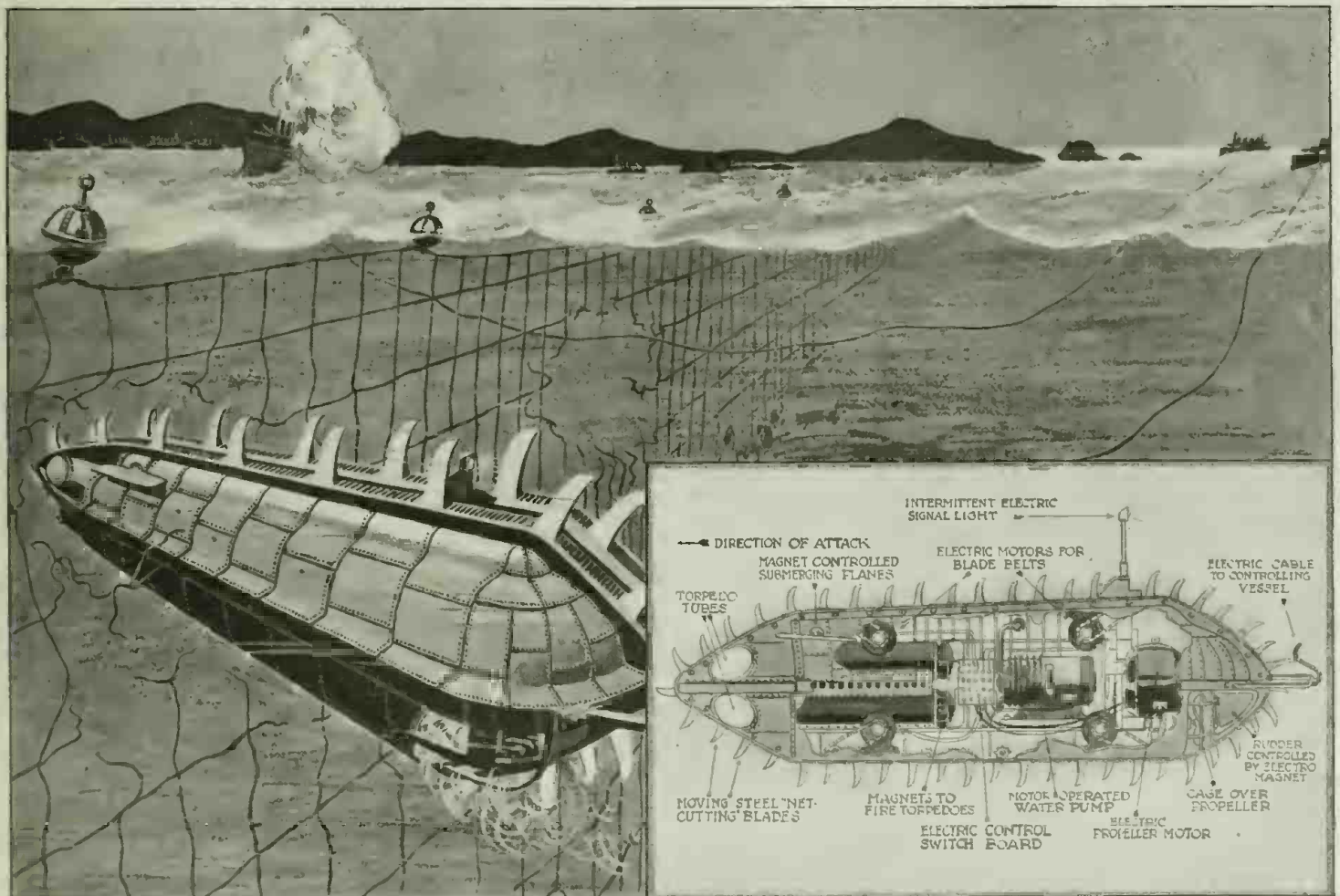
By H. WINFIELD SECOR

THE very latest war-time animal is the electric "Sea Tank" as used by the Italians in a recent naval raid on Pola, Austria's famous naval base. From the information available on this latest hybrid among war-time offensive devices, it is learned that the Sea Tanks measure about forty feet in length and six feet in width, and that they are propelled

barbs or knives which can cut their way thru nets and other obstacles just like their prototypes, the land tanks, first used so effectively by the British. This under-water demon is provided with several torpedo tubes at the bow, and from all accounts, it seems that the device was crewless, and operated by means of electrical control currents sent thru a flexible insulated cable

their way thru the heavy steel nets spanning the navigable approaches to the port, within which there lay at anchor Austria's fighting fleet, and that a mighty Austrian battle-ship of the *Viribus Unius* type of about twenty thousand tons displacement was torpedoed.

The detail illustration herewith shows the probable arrangement of the interior of



Copyright, 1918, by E. P. Co.
 The Italian Navy Recently Carried Out a Remarkable Attack On Pola, Austria's Famous Naval Base, in Which the Latest Engine of War, The Electric "Sea Tank," Played the Leading Rôle. These Monsters with Their Net-Cutting Knives and Controlled by Electricity from a Mother Ship, Past Thru All the Harbor Barriers and Blew Up a 20,000 Ton Battleship.

by electricity. Further, as our illustration herewith shows, these Sea Tanks are provided with an endless rotary chain, running lengthwise around the vessel, these rapidly moving chains being fitted with sharp steel

connecting with a war vessel, which latter nosed its way up to within a few miles of the steel nets guarding the harbor of Pola. The account of the attack on Pola by the Italian Sea Tanks states that they bored

the Italian Under-water Tank, also the arrangement whereby the steel belts carrying the net-cutting knives or barbs are driven by powerful electric motors, which obtain current from a storage battery carried in

How Artillery Observation Balloons 'Phone to Earth

When the artillery observers of our army in France, go up in balloons for the purpose of spotting the shell hits and correcting the ranges, they must have a positive and sure means of communicating with the artillery officers on the ground. The photograph herewith shows a telephone dug-out in France with two United States soldiers, who are in direct telephonic communication with the aerial observer above by virtue of a thin copper wire which runs up to the balloon basket. The work of the aerial balloon observer is more or less hazardous, and it not infrequently happens that the observer's balloon is shot down by an enemy shell, in which case he must use his wits and endeavor to make a safe landing with his parachute. On the other hand, it has often been remarked by officers who have had the opportunity of seeing service near the European battle-fronts, that these observation balloons will sometimes remain aloft and unscathed for days at a time. The work is extremely interesting and plenty of volunteers are always available. It takes a

man of keen sight and quick perception to fulfil the duties of an observation officer, as



Photo © by Committee on Public Information

This Photograph Shows Two American Telephone Men in a Dug-Out in France, Carrying on Communication With an Aerial Observer in a Balloon. These Men Perform a Most Important Service in That They Control the Fire of the Artillery.

the changes in range in some cases have to be made very quickly in order to bring about a certain military maneuver. We may safely entrust this task to Pershing's boys.

OBTAINING ELECTRICITY DIRECT FROM COAL GAS.

Electricity direct from coal gas is proclaimed as a possibility. According to the claims of a prominent New York engineer, the new process involves an electrolytic cell used as follows: The method is to dissolve in an electrolyte of fused borax the oxid of a metal such as manganese, which forms two or more oxides of different degrees of oxidation, and passes from a lower to a higher degree of oxidation when in contact with air, and from a higher to a lower when in contact with a reducing agent, such as fuel gas. When the solutions of a higher and a lower oxid are brought into liquid contact at any point a difference of electrical potential results, and if an appropriate electrode is immersed in each of the solutions a current of electricity will pass in a conductor joining them, so long as the difference of oxidation respectively in the two solutions is maintained. The current is about one volt, and from 15 amperes upward

Madrid gets its electricity for lighting and power from a hydro-electric plant 120 miles from the city.

An electrically equipt tremolo attachment for stringed instruments has been invented which produces the desired effects when buttons are prest.

the undersea craft, or from electric energy supplied thru the cable connected with it.

The electrical control cable in such devices as this, and where it is of any considerable length, is invariably coiled up and stored in the tank or torpedo, as otherwise the device would have to be extremely powerful in order to pull the constantly increasing length of cable thru the water if it were stored in a magazine on the tender ship.

It is entirely feasible for a device of this kind to be controlled by a warship of the destroyer class at a distance of seven miles or even eight to ten miles or more. With ingenuity and the proper design of the device of the type here under discussion, and also in consideration of the undoubted and proven cleverness of the Italian engineers, there is no doubt but what such a device could be sent out and steered so as to be submerged when it neared the steel nets and to bore its way thru them, and then to rise again; also at this juncture the observation officer on the war vessel looking thru his night glasses, could press the proper electric control button and cause one or more torpedoes to be discharged at an enemy war vessel in the manner described in the report from Rome, and which now forms a part of Italian naval history.

In any event, the Sea Tank would appear to prove an invulnerable antagonist against such war measures as harbor nets and the like, and it is conceivable that when designed to carry a crew, and providing the craft is equipt with powerful under-water searchlights, such a machine should prove highly effective in clearing out mine fields, and particularly such mine-infested waters as those leading up to the great German naval base at Heligoland. This maneuver by the Italian Sea Tanks in their attack on

Pola may seem all the more practical and possible to the layman when it is considered that the entire Gulf of Venice is very shallow—about 120 feet at greatest depth—and such an underwater fighting monster might crawl even along the bed of the Gulf of Venice and tackle the steel nets and mines protecting Pola, much in the same manner as a gigantic turtle would crawl along the bed of a lake. In fact, some engineers venture the opinion that with the proper design of the moving caterpillar belts and bars, that the Tank could be made self-propelling in the same manner as just mentioned.

It is most probable however, that the Italian Sea Tank as now used is fitted with powerful propellers the same as the submarine, and also that it has a suitable rudder for the purpose of steering it. To prevent the cable from becoming fouled in the propeller blades, the latter are encased in substantial steel cages. The pilot light or lights are provided with shields at the front, so as to throw intermittent signal flashes sternward, and by arranging this on a telescopic mast the officer in charge can, by simply pressing the proper button, cause them to rise ten to fifteen feet above the back of the Sea Tank while it is progressing thru the water near its objective. When the Tank has progressed sufficiently near the net or other obstruction it is to burrow thru, the proper electrical impulses are sent over the electrical control cable which starts up the water-ballast tank motor, and by filling the tanks, the craft is caused to submerge. It is a simple matter and one which has been used heretofore to provide a suitable electrical position indicating arrangement, whereby it becomes possible to know at any instant the direction and location of the

"Sea Tank" while it is submerged. By means of a sensitive microphone installed in the vessel, it would be possible to ascertain when the Tank had chewed its way thru the enemy nets, and it could then be caused to approach the surface again if so desired. It is not however, imperative that the vessel be made to come to the surface so as to show the signal light, for by means of the position indicating apparatus just described, its exact position at any moment could be known and torpedoes discharged from it at an enemy war vessel swinging at anchor within the netted area.

U. S. PATENT OFFICE NEEDS EXAMINERS.

The U. S. Patent Office announces a need for technically trained persons for the examining corps of the Patent Office. Men or women are desired who have a scientific education, particularly in higher mathematics, chemistry, physics, and French or German, and who are not subject to the draft for military service. Engineering or teaching experience in addition to the above is valued. The entrance salary is \$1,500.

Examinations for the position of assistant examiner are held frequently by the Civil Service Commission at many points in the United States. One is announced for August 21 and 22, 1918. Details of the examination, places of holding the same, etc., may be had upon application to the Civil Service Commission, Washington, D. C., or to this office.

Should the necessity therefor arise temporary appointments of qualified persons may be made pending their taking the Civil Service examination. Application for such appointment should be made to the Commissioner of Patents, Washington, D. C.