

# Wireless on the American Submarine Chasers

By SAMUEL COHEN

**T**HE greatest task of the United States in the war against Germany is that in overcoming the under-sea monsters, the SUBMARINES, which have proven to be a constant and rapidly increasing menace to both the Allied and American shipping.

transmitting set is seen on the right and the apparatus comprising the installation consists of the following and all of which are mounted on a Bakelite panel. The source of high tension current for charging the condenser is derived from a special spark coil, stationed behind the panel. An inde-

obtained with a primary excitation of 6 volts, obtained from a storage battery. The current consumed by the primary of the spark coil is indicated by the two lower meters; the one toward the left indicates amperes, and the one toward the right, volts. The simple-pole double-throw switch below the two meters is used to throw in either 6 or 12 volts onto the primary of the coil; the latter voltage must naturally be derived from a 12 volt battery or other generating source. Terminals for the current source are located below the switch. The plug towards the right interconnects a key with the coil as perceived; while the plug on the left is employed for connecting the receiving apparatus with the antenna and ground, thru the change-over switch which is located directly over the voltmeter.

The oscillatory circuit of the equipment consists of the secondary of the induction coil generating the high tension voltage which is used to charge a moulded type condenser, thru an inductance and a quenched gap discharger, the latter being visible in the center. Annular grooves are cut on the surface of the outside plate for rendering greater cooling facilities to the gap. A radiation ammeter is also furnished and this is placed on top of the panel.

The receiving equipment consists of a standard cabinet outfit, with crystal detector which can be seen to the left of the transmitting panel. It is comprised of an inductively coupled tuner which has a fixt coupling coil, linked with a variable capacity for tuning to different wave lengths. This condenser is mounted in the center. A short and long wave change-over switch is employed and this is placed at the center upper corner. The detector is of the mineral type and is mounted below the condenser, while the buzzer, for test work is just below the detector.

The complete outfit has been found to be very satisfactory and efficient and it will no doubt prove to be highly serviceable to Uncle Sam's mosquito fleet.

In addition to the excellent transmitter above described a very efficient and all-around receiving outfit has been designed and built by Messrs. L. G. Pacent and A. H. Grebe for the submarine chasers, and this outfit is illustrated in Fig. 2. This equipment consists of four units, viz., a main tuning cabinet, loading cabinet, detector

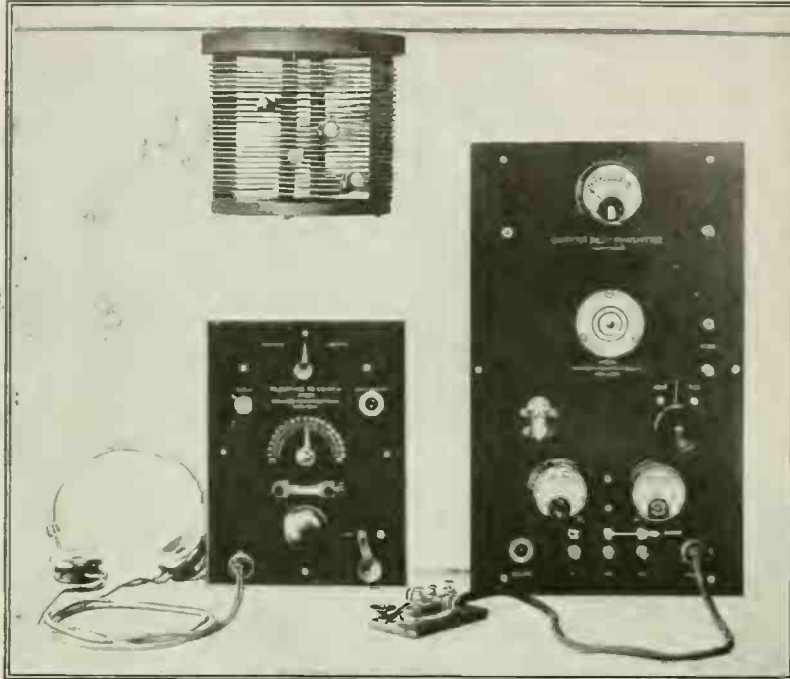


Fig. 1—Space is at a Premium on the "Submarine Chaser." For Such Radio Service There is Available the Extremely Light-Weight Transmitting and Receiving Set Illustrated. It Utilizes a Spark Coil with Independent Vibrator for Batteries.

This problem is now in the hands of our most prominent scientists, inventors and marine experts, and one solution to this task seems to have been found in the building of hundreds or even thousands of high-speed armed motor-boats to be used in fighting the U-boats.

One of the most important details in equipping these "submarine chasers" is that of radio-communication apparatus to be used for notifying near-by vessels of submarine attacks and the like. The marked development in the art of radio-telegraphy in recent years has demonstrated that every vessel to be used for the above named work should and can be equip with a suitable light-weight, yet highly efficient radio transmitting and receiving outfit.

A considerable variety of such apparatus have already been designed and built and we give below descriptions of several types of transmitting and receiving sets which will prove very effective for the work in question. The accommodations offered by submarine chasers are few and for this reason the radio engineer must comply with the accommodations as much as possible before he undertakes the designing of the equipment. Space is a very important factor in consideration, and for this reason the apparatus herewith described have been chosen since they are of the most compact type ever built for the efficiency which they have shown.

The first of these outfits is illustrated at Fig. 1. This set was designed and built by Mr. A. B. Cole, of New York City. The

pendent vibrator is employed and this is mounted on the panel, and may be seen directly to the left of the antenna switch, which is the right circular knob. A number of important features are incorporated in this independent vibrator, viz., a high-tone, corresponding to a 500 cycle generator, is



Fig. 2—An Excellent Audion Type Radio Receptor for "Mosquito Fleet" Service. It is Fitted with "Radiumized" Dials That Glow in the Dark.

cabinet, and an emergency crystal detector. The main tuning cabinet is the largest of the three and comprises an inductive coupler, coupled with variometers, the latter of which are controlled by two handles, while the center one operates a variable condenser linked in the secondary circuit. The handle on the left side is used to control the secondary coupling. The two-point switches are employed for regulating the inductance of the primary of the inductive coupler.

The cabinet on top of this is the loading box which contains the proper coils for aiding the regenerative Audion circuit; the center knob is the coupling handle, while the two side knobs are the inductance control handles. The cabinet to the right is the detector box in which the vacuum detector is housed. An opening fitted with a sliding door is used to note the illumination brilliancy of the detector bulb. The switch to the right is the filament switch while the one to the left is the "B" battery control switch. A variable resistance is secured to the side of this cabinet (not shown here) and this is used for regulating the current consumption of the filament. The emergency crystal detector is hooked up to the set thru binding posts at the bottom of the main tuning cabinet.

One of the most striking characteristics of this receiving outfit is that which has been overlooked by all of our radio engineers designing apparatus intended for warfare purposes. This is the application of the wonderful properties possess by radium of giving forth light when mixed with certain phosphorescent materials. All of the graduated dials of this equipment are painted with phosphorescent radium paint which glows in the dark, and which facilitates working operations of the operator when he is ordered to have his den pitch dark during certain engagements in war. This will certainly be appreciated by the radio operator who has to operate this receiving set. All connections of the various pieces of apparatus are made by means of square shaped aluminum wire which has been found to be very effective for wiring purposes, as it is easier to wire and at the same time gives a better appearance to the finished instrument. It also reduces the weight.

The illustration, Fig. 3, shows a well-built set designed by Cutting and Washington. This outfit utilizes a new principle in radio transmitter design involving the use of a special spark gap, by means of which powerful oscillations and a hy-tone signal are produced in a very simple manner without a transformer. The antenna wave length can be changed with this set by altering the secondary of the oscillation transformer only, the primary remaining fixed.



Fig. 3—Particularly Efficient Radio Set Well Adapted to "Mosquito Fleet" Service.

## A Medal of Honor to be Awarded by the Institute of Radio Engineers

The Board of Direction of the Institute of Radio Engineers has decided to award annually a "Medal of Honor" to such persons who have distinguished them-

recognized standing and must be in actual, tho not necessarily commercial, operation. However, preference is to be given to widely used and widely useful inventions.



New "Medal of Honor" to be Presented by the Institute of Radio Engineers Each Year to the Person Who, During the Two Preceding Calendar Years, Shall Have Made Public the Greatest Advance in the Art of Radio-Communication.

selves by unusual advances in the fields of radio-telegraphy and telephony. It has been felt that some way should be found whereby valuable work in these fields of great and rapidly growing importance might properly be recognized by an authoritative engineering society. As is well known, the Institute of Radio Engineers, with more than 1,000 members here and abroad, and with sections in New York, Washington, Boston, Seattle, San Francisco (with others in contemplation), is the leading technical and scientific society in the wireless field. It is therefore recognized that a "Medal of Honor" from the Institute will be a goal worthy of attainment by any investigator.

The appearance of the medal is as follows: The front is a symbolic representation of electromagnetic waves, indicating the interlinking of the magnetic and electric forces in their rapid path thru the depths of space. The reverse side bears the inscription:

"To ..... in Recognition of Distinguished Service in Radio Communication" (followed by the date), the inscription being surrounded by a laurel wreath.

The medal is the work of the well-known sculptor, Edward Sanford, Jr., of New York.

The award will be made yearly at the April meeting of the Institute to the person who, during the two preceding calendar years, shall have made public the greatest advance in the art of radio-communication. The advance may be a patented or unpatented invention, but it must be completely and adequately described in a scientific or engineering publication of

The advance may also consist in a scientific analysis or explanation of hitherto unexplained phenomena of distinct importance to the radio art, altho the application may not be immediate. Preference will be given to analyses directly applicable in the art. In this case also publication must be full and in approved form.

The advance, furthermore, may consist in a new system of traffic regulation or control, a new system of administration of radio companies or the radio service of steamship, railroad or other companies, a legislative programme beneficial to the radio art, or any portion of the operating or regulating features of wireless. It must be described publicly in clear and approved form and must, in general, be actually adopted in practise. In all cases, marked preference is to be given to advances made in the preceding year.

The medal is to be awarded under the following conditions:

At least thirty days before the April meeting the Board of Direction will call from a number of members and fellows of the Institute, whom it may choose to consult, for suggested candidates. This provision will be waived wholly or in part for 1917 only.

In deciding upon the award, the Board at its April meeting, thru those actually present or voting by mail, will nominate at least one, but not more than three candidates, in order of preference for the award. The names of these candidates will then be sent to each member of the board, who will have the privilege of returning a vote for one candidate. Four weeks after the April meeting the ballot will be read, and the candidate receiving the most votes will become the recipient of the award.

The official presentation of the medal to the successful candidate or his representative will occur at the May or June meeting.