VOLUME I NO. 3

PACIFIC RADIO NEWS

MARCH, 1917 TEN CENTS

IN THIS ISSUE

The Advantages of Privately Owned and Operated Commercial Wireless Equipments

First and Only Wireless Magazine published on the Pacific Coast

Pacific Radio News

The publishers hereby disclaim the entire responsibility of the statements made in this Magazine. We wish to state that the "Pacific Radio News" is an organ for the conveyance of knowledge or opinion from author to reader, and we will publish any and all sides of various controversies pertaining to the art of radio communication providing they are written in a presentable manner

MARCH, 1917

Pacific Radio News

A Monthly Magazine of Radio Communication

Published by the Pacific Radio Publishing Co.

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Contents

CHANGE OF ADDRESS—We should be notified promptly of any change in your address, giving both the old and new location. The Postmaster, as well as the Publishers, should be notified of the change.

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Large Wireless Corporations and Steamship Owners Favor Proposed Radio Act

First Six Hearings of Bill Disclose Attitude of Leading Manufacturers of Radio Apparatus

Kilbourne & Clark Co. and Atlantic Communication Co. Favor Bill

A copy of the first six hearings on H. R. 19350, A BILL TO REGULATE RADIO COMMUNICATION, and which will eventually place all commercial land stations under government control, has been submitted to the Pacific Radio Publishing Company by Mr. Joshua W. Alexander, chairman of the Committee on the Merchant Marine and Fisheries. The bill passed its first hearings from January 11th to 17th, inclusive.

The publishers of the Pacific Radio News approve of the bill and have forwarded a communication to Mr. Alexander to that effect.

From information on hand it tends to prove that many leading wireless and steamship corporations are in favor of the bill; many have urged its passage without amendment. Among these are the following: Kilbourne & Clark Mfg. Co., Alaska S. S. Co., Booth Fisheries Co., Pacific S. S. Co., San Juan Fishing & Packing Co., Atlantic Communication Co., the users of the Telefunken system of radio telegraphy, Luckenbach S. S. Co., Merritt & Chapman Derrick & Wrecking Co., and numerous other wireless engineering corporations.

The bill, if it becomes a law, will not enable the government to take possession of all commercial land stations in a forcible manner, but provides that the stations can be purchased by the government in the event that the owners of the stations desire to sell.

Interference between commercial and government land stations will be greatly decreased, if the number of land stations is decreased, and a better means of communication between ship and land stations will be the result. U. S. naval stations will handle all commercial and navy ship traffic and will eliminate the necessity of having both a commercial and navy station in close proximity to each other.

The Southern Pacific Company, which has a number of its vessels equipped with radio apparatus, favors the bill in part but objects to any measure that may lead to the collection of tolls for service offered by the navy stations. Ships equipped with Marconi apparatus are at liberty to exchange steamship business by

means of Marconi land stations without charge to the steamship owners, while if the business is handled by a navy station the regular navy tolls must be paid by the steamship owners.

Here is what the Kilbourne & Clark Manufacturing Company thinks of the new proposed bill:

We are in favor of the passage of this bill without amendment. We believe, that, if it becomes a law, progress, in the art of radio communication will be greatly accelerated because of either greater governmental control or complete administration of costal radiotelegraphic stations. We are of the opinion that closer supervision of such stations by the government is of vital importance in the process of creating a greater American merchant marine; aside from the fact, which should be undisputed, that national supervision or outright ownership is desirable for military reasons.

We are engaged in the manufacture of radiotelegraph apparatus and sell **our products outright to shipowners. It is of interest to us and our customers to know that ships equipped with independent radiotelegraph sets shall at all times be able to communicate upon equal terms with any other radiotelegraph station either afloat or ashore.**

From the standpoint at least, of all shipowners who own and operate their own radiotelegraph equipment, and of all manufacturers thereof, who sell their apparatus and are not engaged in its operation, there can be no doubt as to the desirability of the enactment of this law.

Commander Todd spoke highly in favor of the bill and from indications on hand at the present time it leads us to believe that the bill will eventually become a law.

It will have no effect on the operation of amateur stations.

ALASKAN POSTMASTER USES WIRELESS EQUIPMENT TO ADVANTAGE IN HANDLING OF MAIL.

By A. E. Kindell.

During the month of August, 1897, I secured a position as Morse operator and electrician with a mining corporation in Atlin, B. C. After being in the employ of the mining company for a term of three years I was successful in securing a position with the Post Office authorities in Skagway, Alaska. For political reasons I resigned by position as Postmaster during the month of March, 1916, and am now employed as an Electrical Engineer with the Home Power Company.

In connection with the Post Office work, my amateur station proved to be of great assistance in the handling of the United States mail, as it enabled me to keep in touch with the mail steamers several hours prior to their arrival at Skagway. The station was installed at my own expense and the saving in time that it effected soon paid for the entire equipment. The mail steamers were enabled to inform me of the number of bags of mail they had aboard and the infortion was at once sent to the mail messenger, who made the necessary preparations for the handling of the mail. As Skagway is the distribution point for Alaskan mails, and as a steamer would sometimes have as many as 500 sacks of mail aboard, the advantages of the wireless equipment will at once be forseen.

During the early part of 1905 a traveling expert of the United Wireless Telegraph Company visited Skagway in order to sell wireless stock and took up a suitable location for a wireless station. Owing to the numerous mountains that surround the town, he stated that it would not be possible to erect an efficient station in Skagway. This assertion was doubted

(Continued on Page 134)

The Advantages of Privately Owned and Operated Commercial Wireless Equipments

(An article pertaining to the advantages of equipments as leased by large corporations to steamship owners has already been published in a wireless magazine. The following article will give you the OTHER side of the story and will tend to prove our monthly statement to the effect that we will publish any and all sides of various wireless controversies.—Ed.)

By G. Haller

The advantages of wireless telegraphy on shipboard are too well known to every one today to dwell upon them at any length.

Even steamers not required by law to be equipped with radio apparatus are today deriving many advantages from voluntary equipment, among which we might mention the convenience of being able to communicate with the owners any time of the day or night, the elimination of anxiety regarding safety of vessel in time of storm, the receiving of derelict warnings or time signals by the captain, the safeguarding of life, property and loss of time.

Vessels carrying wireless equipment can often avoid salvages by having relief sent in time of accident by neighboring ports at contract price instead of being at the mercy of the first vessel which happens to come to their relief. Also in the matter of insurance, risks are often accepted or rejected depending on whether the vessel carries a radio equipment or not.

Advantageous charters are often determined by the fact that the vessel is in constant communication with the home office.

While the above advantages are generally recognized by all up-to-date ship owners, the high rentals on leased apparatus have prevented a more universal installation of radio apparatus. The rental plan is not a logical one. Wireless apparatus is as much an integral part of the ship as its boilers and engines and there is no more justification to rent radio equipment than the former. Certainly there are many disadvantages to the shipowner from the leasing plan.

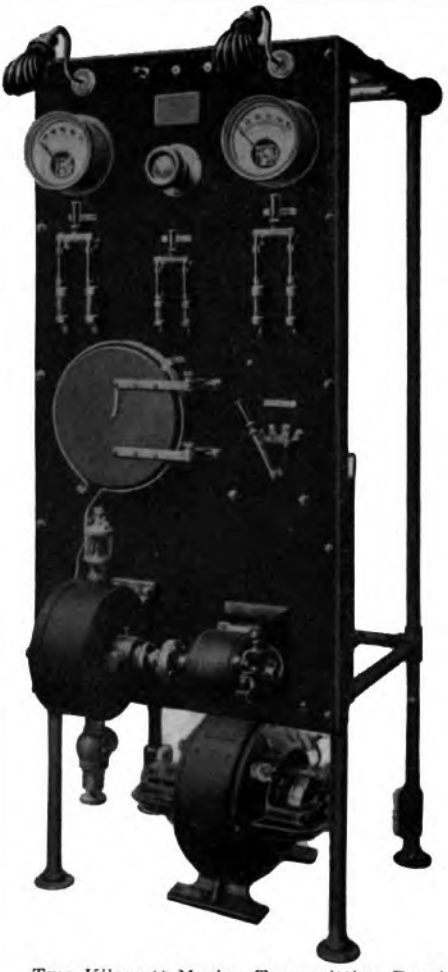
Privately owned outright purchased installations have all of the advantages of leased equipments and, in addition, have the following points in favor:

(1) The greatest saving in expenses. The interest on the investment and maintenance charges of a privately owned equipment is less than one-sixth of the average yearly rate.

(2) The apparatus is entirely under the control of the ship owner, and is not owned by an outside operating company whose interest may at times conflict with those of the ship owner.

(3) All toll revenues from private messages, relaying of messages from other ships, amounts awarded by courts for salvages, in which the wireless equipment on board plays an important part, accrue to the ship owner when privately owned apparatus is installed.

(4) The operators of privately owned apparatus are in the employ of the ship owner, and being permanent officers of the ship and not being subject to change from ship to ship at the whim of the leasing company can become more familiar with the apparatus entrusted to their charge and consequently more efficient, they will



Two Kilowatt Marine Transmitting Panel

The new type Halcun panel transmitter possesses numerous improvements over the old type of panel set. A new type of oscillation transformer is employed, as well as many minor improvements on the instruments and panel proper.

The Hy-tone rotary quenched gap with an improved alcohol feeding device is used for the spark discharger.

A 60 cycle, 110 volt motor generator supplies current to the transformer primary, a specially constructed transformer being used for the successful operation of the Hy-tone gap.

The condenser, transformer, protective devices and wiring are neatly installed on the back of the panel.

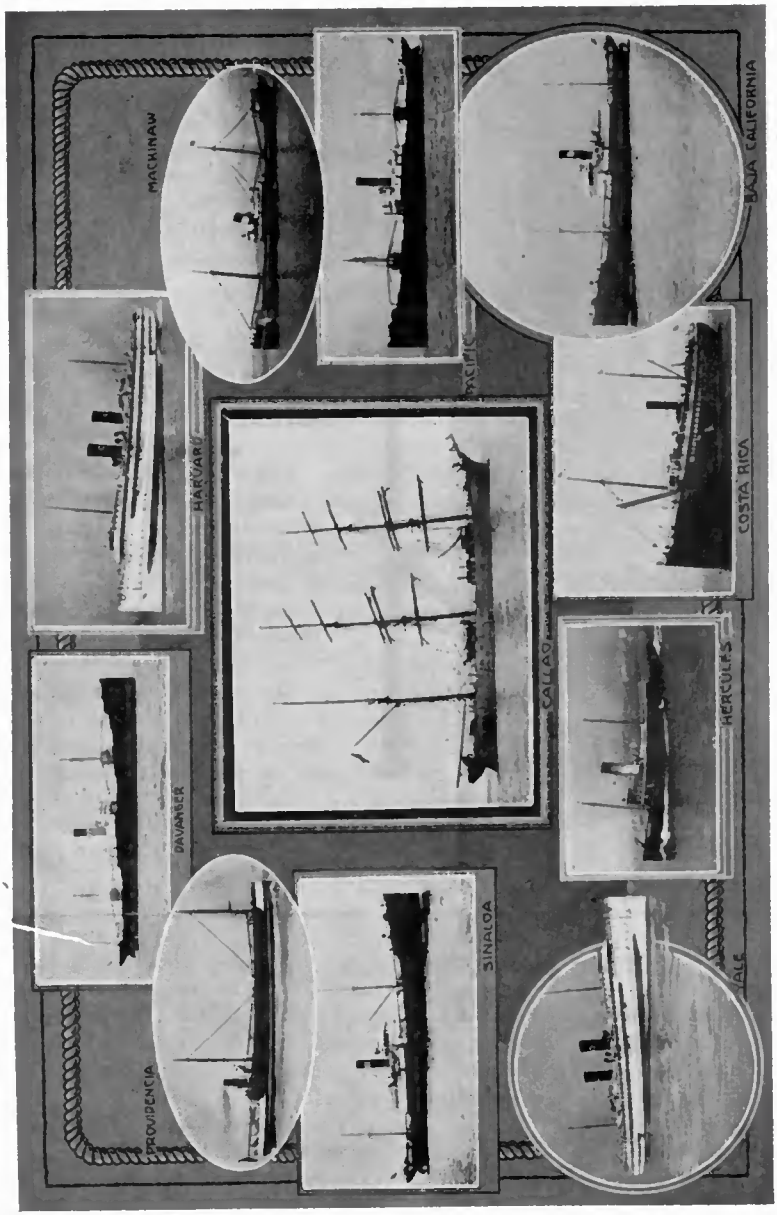
also have the owner's interest more at heart.

(5) When a continual watch is not required by law, the operator can often be used in other positions, effecting further reduction in operating expenses.

The following excerpt from the London Convention of which the United States and most civilized countries are a party make it compulsory for land stations to accept messages from all ships, irrespective of make or ownership of equipment. Furthermore, land stations are public service in their character and are required to accept business from everyone at published rates in the same manner as telegraph and telephone companies:

"Coastal stations and stations on shipboard shall be bound to exchange radiograms without distinction of the radio system adapted by such stations."

All privately owned sets are capable of maintaining communication with ships and land stations using the



A FEW OF THE VESSELS EQUIPPED WITH HALCUN APPARATUS

Semi-Portable Set for Limited Space

spark method of wireless telegraphy, such as Marconi, Telefunken, and all other marine and land spark installations.

Public Property Since August 16, 1915

In considering the purchase of privately owned wireless equipment, the question of patent liability arises. Competing wireless corporations claim that their sets do not infringe any patents. The brief history and development of wireless telegraphy is as follows:

Prof. Hertz of Germany, in 1888, discovered electromagnetic waves and the methods of generating, transmitting and detecting them. This discovery is the basis idea from which wireless telegraphy grew. Many experimenters added to the work of Prof. Hertz and in 1897 Sr. Marconi secured a patent on the use of these prior discoveries of Hertz and others as applied to commercial wireless telegraphy. Marconi's discovery consisted in the use of an aerial structure together with a ground connection.

The life of a patent in the United States is seventeen years and is not subject to renewal. In most foreign countries is it only fifteen years, hence it is seen that Marconi's basis patent covering the use of an aerial and ground expired in 1914, and since then has been public property. In the two years following the issuance of the Marconi basis patent of 1897, hundreds of patents were filed by various experimenters in every part of the world, this activity stimulated by the original Marconi announcement.

Most of these patents were conflicting, due to a lack of knowledge in the patent office on this new subject, and the granting of many of them has caused the greater amount of the litigation which has since ensued.

All of the patents granted during that period have expired, so that we need give ourselves no further concern with them.

Wireless telegraphy made little headway until 1899, due entirely to a lack of knowledge on tuning. In 1898 Oliver Lodge secured a patent on tuning. The rights granted by this patent were secured by the Marconi Company. The discovery of Lodge made long distance wireless telegraphy possible, shortly after a transatlantic message was sent, and the equipping of ships with high power apparatus was begun.

The tuning patent has been the greatest obstacle in the way of privately owned equipment. It expired on August 16, 1915, and since that date the last important patented feature of wireless telegraphy has become free to all. There are still in effect many minor patents covering various designs of detectors, discharge gaps, resonance of circuits, methods of excitement, etc. The use of none of these patents is essential to long distance wireless telegraphy. Certain patented devices do add to the efficiency, and where such devices are used, royalties are usually paid for their use under licenses issued to the manufacturing company.

The Halcun equipment illustrated in the accompanying photograph compares favorably with panel equipments of competing manufacturers. The panel is so arranged that the operator is within easy reach of the controlling devices and being but a few feet distant from the panel, he will have no difficulty in reading the meters that indicate his radiation and power consumption. The receiver and key are all placed within easy reach of the operator.

Halcun Complete Set as Installed on S. S. "Pacific"

As an example of a privately owned wireless transmitting set, let us consider the Halcun type as adopted by many steamship owners on the Pacific Coast. The system used differs greatly from all others, the following account will describe the apparatus in detail.

One photograph plainly shows the complete Halcun type of wireless apparatus employed by the Norwegian Steampship Company, the Halcun apparatus being installed on the steamers "Pacific" and "Davenger."

As the panel type transmitter shown in the photograph has already been discussed and described in various wireless books and magazines, only a few important features remain to be pointed out.

The panel transmitter is known as the type "D" Halcun Marine Transmitter, a power imput of two kilowatts being employed. The dimensions of the set are twenty-eight inches wide, sixty-five inches high and eighteen inches deep. The receiving cabinet requires a table space of only twelve by twenty-four inches. The set takes up a minimum amount of space and can in all ordinary cases be installed in the same cabin occupied

by the operator for sleeping quarters. This is a big advantage at times, as often extra passengers may be accommodated whose fare will pay for the expense of the equipment.

The Halcun transmitter is very quiet in operation, the discharge gaps being entirely enclosed in a heavy iron casting. The old time, noisy, nerv-racking spark has been entirely eliminated. This is an advantage not to be lost sight of, especially since wireless communication is practically handled entirely at night.

The range of any particular installation depends on many things, such as position of the ship, amount of power available from the ship's generating set, the height of the masts, distance between masts, whether the hull is of steel or wood and many other conditions. Ships equipped with a 2 K. W. Halcun transmitter have been capable of sending messages over 2,000 miles distance, this of course under favorable conditions. The average range under ordinary conditions can be taken as from 400 to 600 miles. A 5 K. W. equipment will handle business from 1,000 to 1,500 miles under ordinary conditions and up to 3,000 miles under exceptionally good conditions.

Wavelength Adjustment

The transmitting set is arranged to operate at two fundamental wavelengths required by law, namely 300 and 600 meters. In addition to these, a third wavelength of 500 meters is provided for.

This feature is of considerable advantage at times when a number of ships all working at 600 meters are interfering, making transmission impossible.

At such times by a single change, not taking five seconds to effect, the operator can drop down to 500 meters and readily get his message through.

Permanent Investment—Not An Expense

The aerial construction is of the most permanent nature. When a privately owned set is installed it can be done in a more substantial and thorough manner.

The Latest Type of HALCUN CABINET RECEIVER

The cabinet proper is constructed of oak, the switch points, etc., are mounted on a polished hard rubber panel and give the set a pleasing appearance.

A loading coil, tuner, 2 detectors, condenser and test buzzer are mounted in and on the cabinet.

They can be actually a part of the ship's permanent equipment. The wiring is done in metallic conduit. Voltmeters, ammeters, fuses, radiation meters, and other permanent equipment not ordinarily found in leased apparatus are included in the Halcun type of installations. The ground connections on wooden hulls should be made where practical, to a copper plate on the hull of the vessel, and not through the engine, a practice, which we believe has been responsible for the rapid corrosion of condenser tubes on vessel grounded to the engine.

Auxiliary Power Supply

On vessels where an auxiliary source of power independent of the ship's generator is required, a set of storage batteries is supplied, these batteries being capable of operating the main set so as to give a day range of 100 miles.

Ships Equipped With the Halcun System

S. S. Mackinaw.
S. S. Providencia.
S. S. Costa Rica.
Sch. Expansion.
S. S. Pacific.
S. S. Davenger.
S. S. Baja California.
Bark Callao.
S. S. Carlos.
S. S. Fort Bragg.
S. S. Santa Rita.
S. S. Harvard.
S. S. Yale.
S. S. Ituna.
S. S. Malmanger.
S. S. Sinaola.
S. S. Governor Forbes.
S. S. Talbot.
S. S. Thordis.
Tug Hercules.
S. S. Regulus.

Nine Alaskan stations are also equipped with Halcun apparatus, the power of the equipment varying according to the location of the stations.

HALLER CUNNINGHAM COMPANY GETS THE "REGULUS"

The Norwegian freighter "Regulus" will be equipped with a 2 K. W. Halcun marine set during the latter part of February and will be placed in the South American trade upon completion.

She was constructed at the Union Iron Works' plant in San Francisco and displaces 6,000 tons. She is owned by the C. Henry Smith Company who have the Halcun apparatus installed on three of their ships, namely, the "Sinaloa," "Baja California," and "Governor Forbes."

45 CRACK NAVAL OPERATORS FOR NEW STATION

By Our Mare Island Correspondent

San Diego's new $300,000 naval radio station at Chollas Heights had its preliminary test during the early part of January, according to an announcement made by Lieut. Ernest Swanson, port commander.

The huge arc transmitter has already been installed and the dynamo-to-transmitter wiring has also been completed.

Lieut. Stanford C. Hooper, attached to the bureau of steam engineering at Washington and to the staff of the director of the naval radio service with headquarters in San Francisco, arrived here on January 14th to witness the official test.

A number of crack naval operators are at Point Loma and Chollas Heights ready for assignment to the new station and more are expected within the next ten days. A total of forty-five operators will be on duty at Point Loma and at Chollas Heights.

100TH POWER OF 5 BAFFLES RADIO INSPECTOR

A Radio Inspector's daily routine does not merely consist of examining radio operators or the tuning of sets to resonance but also to the answering of scientific questions asked by inquisitive persons over the telephone.

We quote herewith a few extracts from the S. F. "Call" under date of January 10th to 14th inclusive:

What is 100th Power of 5?—Don't know?—Ask Ellery Stone.

"What," queried a voice on the telephone of Ellery Stone, assistant United States radio inspector, today, "is the one-hundredth power of five?"

Stone never quavered. Instead he proved himself a young man of education and resource. He figured thirty-two seconds and replied. Here was his answer:

23,360,000,000,000,000,000,000,000,000,000,000. Pronounce it, or refute it—if you can. Nobody around the Custom House could today.

Mr. Stone admitted the next day that the answer he submitted was the fiftieth power of 5 and not the hundredth power. This little problem has baffled many professors of mathematics and numerous answers to the question were published daily in the "Call". The next day's paper brought the following returns:

J. J. Nagel of Los Angeles gets a total of 783,584,141,327,870,899,192,165,487,975,863,891,310,761,973,479,681,498,101,806,640,625.

The electricians in the dynamo room of the U. S. S. Rainbow got another answer. They write: "Our total may be pronounced as seven billion eight hundred eighty eight million, six hundred thousand trillion, trillion, trillion, trillion, trillion."

It might be at that.

Mr. Charles H. North of San Francisco is conservative. He submitted this:

9,536,743,640,625.

Mr. J. R. Scott of Oakland was reading the paper aloud to his wife last night until he came to one of the numbers with seventy digits. Then he stopped.

"I defy anybody to pronounce it," he writes.

UP-TO-DATE WIRELESS SCHOOL AT HEALD'S

The wireless department of Heald's Engineering School, 1220 Post St., San Francisco, employs a unique method of training wireless operators for land and marine service. Beginners are given code instruction by mental association of sight and sound. The old method of memorizing dots and dashes of the code and the spending of weeks in re-memorizing the sound of the same characters when produced by a buzzer has been entirely eliminated.

The department of operation and regulations is under the supervision of Mr. Geo. E. Riggens, who for several years was connected with the radio service of the U. S. Navy on the Pacific Coast and formerly in charge of the navy radio exhibit in the Machinery Hall at the Exposition.

The method of instruction (used by no other school in the United States) was invented by Mr. Riggens, and is accomplished by the use of an omnigraph and an electrical device which flashes letters of the alphabet. The letters, as produced by the omnigraph, are also produced by the electric light flasher, thus producing not only the sound of the characters that constitute the letters, but the actual letters as well.

The operating room is amply large enough to accommodate 48 students and each student is assigned to a separate booth, each booth being named after a ship or shore station and by means of suitably arranged circuits the instructor is enabled to work from his desk to any circuit direct, to all circuits at the same time, or, by means of a plugging board, can connect any circuits together as the case may be. Each booth is provided with a typewriter and every facility is afforded the student to become proficient in the art of typewriting; particular attention is paid to penmanship.

The radio school is composed of two departments, i. e., operation and regulations, and electrical.

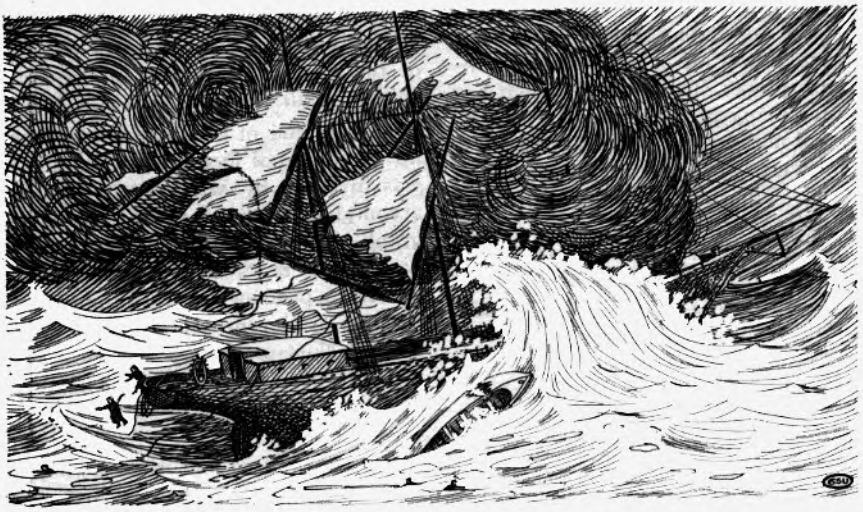
A complete description of the latter will appear in a later issue of this magazine.

HAVE YOU ANYTHING TO SELL OR EXCHANGE?

Our Classified Advertising section has brought many results to advertisers in a previous issue. Turn to this section and read the ads carefully. Why not try a ten word advertisement at the rate of two cents per word?

The Conversion of Captain Nelsen

By Edward Walden.



The ship "Flamingo," bound for Honolulu, passed out of the Golden Gate one bright sunny afternoon in October. She carried a cargo of general merchandise and would return from the Islands sugar laden. Like several other ships on this run, she had accommodations for a few passengers and on this trip carried three.

Harvey Sterritt, an operator on his way to fill a position at one of the Island stations; Mabel Norris, a girl of twenty, and her aunt, a lady of uncertain age, made up the passenger list.

The young people were quickly acquainted and in high spirits over the auspicious beginning of their voyage, and chatted gaily as Harvey pointed out the various landmarks on the rapidly receding shores. The old lady took little part in the conversation, as she was intensely deaf. She was provided with a telephone arrangement with which she could hear fairly well when it was in working order, a condition, however, seldom existing, as parts were disconnected or missing the greater part of the time.

Captain Nelsen was a wooden-faced man of taciturn disposition, whose interest in the passengers did not go beyond the attention he accorded any other live stock, that is, he saw that they were fed and watered and kept from falling overboard so there would be no shortage in his bills of lading at the port of delivery.

At the supper table, which the Captain headed, the talk ran on the Farallon Islands, which they had just passed. They spoke of the isolated life of those on duty and how the loneliness had been mitigated by wireless communication with the mainland. This brought up the subject of wireless telegraphy and Mabel asked the Captain why there was no wireless set on the Flamingo.

"Well, in the first place," replied the Captain, "the owners don't consider the expense justified on a ship of this kind, and in the second place, what would we do with it if we had it? The few passengers we carry can send all their messages before we sail, and as to reporting our position, I cannot see what good that does, as it

fails to hasten or hinder the voyage, and it is time enough to report when we reach our destination."

"But Captain," said Auntie, whose telephone happened to be working and she had heard his reply, "what about a ship in distress?"

"In that case," said the Captain, "we will do as we have in the past—meet the emergency as it arises. Stick to the ship as long as possible, then take to the boats. Don't worry, my dear madam, I have sailed the seas for many years, have been shipwrecked twice, and am still here, and all this without the aid of wireless."

The old lady was not impressed by this assurance and said: "I could not endure life in a small boat. They have no arrangements for cooking, and cold food always gives me indigestion. Besides that, the fresh water invariably gives out, the men's tongues hang out, the sailors go mad, and all sorts of horrible things happen before they reach land, and when they are rescued some are dead, some are crazy, and the survivors have to be fed with a spoon like a baby until they regain their strength."

The Captain started to answer this, but gave it up, and excusing himself, he went above. Harvey, who had taken no part in the conversation, now said: "Many of these old sea dogs have a contempt for wireless. They consider its presence on board as a reflection on their ability to care for their ship. This prejudice is hard to overcome."

Auntie had nothing more to say on the subject, but busied herself stowing away a cargo of hot supper, perhaps with a view of anticipating the time when she would be forced to eat cold food in a small boat.

Auntie retired early in the evening and the young people walked the deck, for it was a beautiful moonlight night with a light northerly wind which gently pushed the Flamingo on her way. As Harvey was a wireless operator, he did not tell Mabel all about wireless and she did not say, "How wonderful," and gaze at him in undisguished admiration at his knowledge.

The weather continued fine and the days passed quickly. Mabel and Harvey were together from breakfast time until late in the evening and their friendship grew rapidly, so rapidly that the observant aunt, whose eyesight was better than her hearing, warned Mabel against what she called "moonshine romance." But Mabel's romance was beyond the moonshine stage and she only smiled on Auntie and said nothing.

Sunday, the tenth day out, the ship was becalmed. The glassy sea had that uncanny look which motionless water always possesses. For the first time Mabel was depressed. She told Harvey that she was reminded of the calm which precedes an earthquake. Her feelings were shared by others and gradually fear of a coming calamity crept over the whole ship's company.

Nothing happened, however, until noon. The Captain slipped on the cabin stairs and fell heavily to the bottom. They got him in his bunk and found he had suffered a severe injury to his knee; whether a fractured bone or a ruptured artery could not be ascertained, as there was no one at hand possessing sufficient knowledge to diagnose the hurt. By the Captain's direction, Harvey looked over the book accompanying the ship's medicine chest and found that bottle No. 8 was the proper remedy for strains and bruises. When he looked in the chest, however, he found the bottle marked No. 8 was empty. Mabel and her aunt had entered the Captain's room to offer their services, and Auntie, seeing Harvey's difficulty, suggested that they mix equal quantities of the contents of bottle No. 5 and bottle No. 3, as five and three make eight, the resulting remedy

would naturally be the same as the contents of bottle No. 8.

This brilliant idea, however, was not carried out, and they applied cold water bandages, which was all Harvey could suggest.

A calm night was followed by another day without a breath of air stirring the waters. The Captain was suffering intensely and Mabel did what she could to ease his pain. She felt, however, that the injury required the services of a surgeon and said to the Captain;

"If you had a wireless set aboard we could summon a doctor from some ship, or at least find out from him what to do for you."

The Captain growled out something under his breath and Mabel thought it wise to beat a retreat.

On deck Mabel found the crew gathered about the port rail watching a large shark who was lying still in the calm water waiting to snap up any bits of food thrown him. The First Mate determined to catch him. A heavy line was rigged with a hook and baited with a chunk of pork. The Mate stood at the rail swinging the hook about his head preparatory to throwing it to the shark. Now occurred one of those odd accidents which seem unreal and are over so quickly that the spectators are dazed. The Mate threw the hook into the sea. As the line followed the hook it kinked and the whole coil struck the Mate on the back of the neck. As he was leaning forward at the time, the blow caused him to lose his balance and tumble over the rail into the sea. As his body struck the water the shark darted forward and the Mate disappeared forever.

Following the Captain's accident, the Mate's death had a marked effect on the superstitious sailors. They looked forward with anxiety for the third mishap which, they said, was sure to follow, as misfortunes invariably came in groups of three.

The day passed and another sunrise came, yet no sign of a breeze. When Mabel came on deck she found Harvey looking forward with an anxious face at a group of sailors on the forecastle. Bottles were passing from hand to hand and all were drinking. From their condition it was evident the carouse had been going on for some time. They had broken into the cargo, secured some bottled brandy and were now beyond control. When the Second Mate remonstrated with them he was met with jeers and finally when he lost his temper and drew a revolver he was instantly struck to the deck by a blow with a bottle that fractured his skull. Paying no further heed to him, the men resumed their orgies.

Mabel, shaking with terror, clung to Harvey, while he, realizing their serious situation, was at a loss to decide what to do. Looking forward again, he noticed the sailors were now engaged in raising the forward hatch, probably to reach the liquor more readily. A moment later a wild cry of "Fire" rang out. They had raised the hatch and a cloud of smoke was issuing from the hold. All wild with drink, all looking with superstitious terror for the third disaster, this came as a climax. With wild cries they scattered and made haste to launch the boats.

Harvey stood with is arm thrown protectingly about Mabel while the men in utter confusion, with nobody in command, struggled and fought over the boats. The first one to reach the water was swamped and its drunken occupants drowned. Sobered somewhat by this, the balance of the crew got the second boat afloat and pulled frantically away from the ill-fated ship. In their haste food and water was forgotten, and the panic had extended to the entire crew. Even the steward had joined the boat at the last moment, leaving the pas-

sengers alone on the ship with the helpless Captain.

Harvey made no move until the boat was rapidly disappearing in the distance. Then reassuring Mabel, he bestirred himself to look after the fire. As the cloud of smoke had lessened, he dropped down into the hold and groped about. He soon located the source of the fire. The sailors had dropped a cigarette while looting the liquor and the straw bottle covers were smouldering, making a heavy smoke, but very little fire. Mabel brought him a bucket of water and he quickly quenched the burning straw. All danger from that source was over and they turned their attention to the Mate, but he was beyond help, and covering his body with a tarpaulin, they left him. Mabel went down to reassure her aunt while Harvey looked after the Captain.

The old lady was still in her bunk, and being without her telephone arrangement, had heard nothing. On the other hand, when Harvey reached the Captain he found a man bordering on insanity. The pain in his knee, his helpless condition and inability to find out what was transpiring on deck had driven him frantic. When Harvey related what had taken place and he realized the true situation, the Captain groaned, then swore, then groaned again. Harvey waited a few minutes, then said rather sarcastically:

"This is one of those emergencies which you had prepared to meet as they arise. How are you going to meet it?"

The question was not easily answered. A full-rigged ship becalmed, one able-bodied man who had no knowledge of navigation. If a breeze did spring up they would be no better off. In fact, with Harvey at the helm, disaster was not only possible but probable.

After a long interval of alternate cussing and groaning the Captain said:

"All you can do is to hoist a distress signal and watch for passing ships. If the wind comes, you will have to carry me up on deck and we will try and sail her."

Harvey nodded and left him. He understood their desperate situation as well as the Captain and cast about in his mind for some means of escape. How he longed for that cabinet set of his own manufacture he had left in San Francisco as being too bulky for his trunk. With his mind still on the problem he sat down to a breakfast prepared by Mabel and her aunt. The latter was in high spirits over the fact that the boats were gone. "Now," she said, "if we have to die it will be quickly over. No long-drawn-out agony of cold food and salt water in an open boat."

Harvey did not heed her, for he was beginning the solution of the problem in the phone hanging on her ear. Turning to Mabel he said:

"If I could find materials we could rig up some sort of a wireless outfit and summon assistance."

Mabel greeted this idea with enthusiasm and asked what she could do to help. He told her what was required and they started in.

They untwisted a piece of wire cable and securing two wires of sufficient length, stretched them from the foremast to the mainmast, using the royal yards as spreaders. They brought the leads down to the wheelhouse, using bottle necks for insulators. The cabin and stateroom were fitted with call bells and they used the wire connecting them to make a tuning coil. A simple detector was quickly constructed and the telephone receiver borrowed from Auntie. A crystal for the detector was the only thing lacking. Harvey explained this to Mabel and she told him she had a box in her trunk which she called her treasure casket when a child. It con-

tained bits of quartz and other crystals she had picked up about her mountain home. She went below and quickly returned with the box. Harvey was delighted to find several pieces of Iron Pyrite among her childhood treasures. One of these proved sensitive when tested with a buzzer he had made from a call bell, and his receiving set, though crude, was complete.

For a sending set he resolved to construct a large buzzer, as there was a plentiful supply of new dry cells in the storeroom. He cut a large iron link in half with a hack saw and wound the arms of one piece with the magnet wire from a number of call bells. With the aid of a clock spring he constructed a vibrator, and his man-size buzzer was complete. Attaching a number of dry cells, he got a pulsation which he was sure would carry at least fifty miles over the sea.

Auntie now entered and imparted two pieces of news. Supper was ready and the Captain was delirious.

They made a hasty supper and returned to the wheelhouse. Seated on an upturned box, Harvey started to send out SOS, using the battery wire as a key. Mabel sat on a coil of rope at his side and watched him with eager interest as he alternately tapped out the distress signal and listened for a response.

An hour passed without result. Still Harvey patiently sent out SOS and still Mabel sat by his side and watched him. Another hour and still another passed. Mabel's eyes grew heavy and finally her head dropped on Harvey's shoulder and she was fast asleep. He slipped his arm about her to support her, but never halted in his persistent call for help. He was sure the crisis was at hand. No doubt blood poisoning had set in and the Captain would not last another twenty-four hours. Outside he could hear a light ripple on the water, foretelling the coming breeze. With that confiding head resting so lightly on his shoulder, life had never seemed so sweet as at that moment.

On board the Tanker Sacul a flunky woke the operator and told him it was one A. M., Frisco time. The operator stretched, yawned and said he supposed he would have to copy KPH press for the Old Man. After putting on a few clothes, he went into the wireless room and put on the 'phones. He paused with astonishment at what he heard. He scratched his head, then looked at the copy of his position message which he had sent to KPH before turning in.

"Yes," he said to himself, "1085 miles from the lightship, yet I can hear an Oakland 'ham' with a spark coil."

But the SOS was persistent and he started his moter and answered it.

When Mabel awoke, Harvey was looking down into her eyes. His voice said:

"It is all right. They are coming for us now. She is the Sacul, Frisco for Honolulu, so she is going our way."

What his eyes told her is best known to herself.

Delighted with the news, Mabel hurried below and awakened her aunt to tell her relief was at hand. This news shouted in her ear elicited no further remark from that lady than that she hoped they would have breakfast before they left the ship.

When the Sacul came alongside at noon a boat was lowered and her Captain hurriedly rowed over to the Flamingo. With Harvey's assistance he operated on Captain Nelsen and checked the blood poisoning just in time. Relieved from his terrible suffering, Captain Nelsen warmly thanked the Captain of the Sacul and asked him where he learned his surgery. "I learned it from the surgeon on the Katrina by wireless this morning. I had sparks send him a statement of your case and he sent me a

message telling me just what to do. You can thank wireless for being in the land of the living at this moment."

After saying this the Captain of the Sacul made his departure. Harvey watched Captain Nelsen with an amused smile. The old Captain was undergoing an inward struggle, as old prejudices die hard. He made several attempts to speak, but finally gave it up and extended his hand to Harvey, who understood the meaning of this action as well as a lengthy speech.

Some months later Harvey was on watch at the Island station. As on a previous occasion, Mabel was at his side. She had brought him lunch and now lingered, as it was lonely at home without him.

Hearing an unfamiliar call, Harvey gave the strange ship the QRA and received the reply:

"Ship Flamingo, Captain Nelsen, Frisco for Honolulu."

Harvey asked the operator how he liked the job on a sailing vessel. The operator replied:

"Pretty good, only the Old Man wants me to eat and sleep with the cans on for fear of missing an SOS."

MORE AGENTS WANTED

Numerous agencies have already been established in various cities but we are still in need of a great many more. Practically all who have inquired in regard to agency propositions have accepted our liberal offer. We allow our agents a better percentage than any other wireless publication. Use your spare time to advantage by securing subscriptions and advertisements for this publication.

Secretaries of radio clubs are desirable agents and should not fail to take advantage of the liberal agency offer that is now open to one enthusiast in every city and county in the United States.

THE DEAD GOONEY

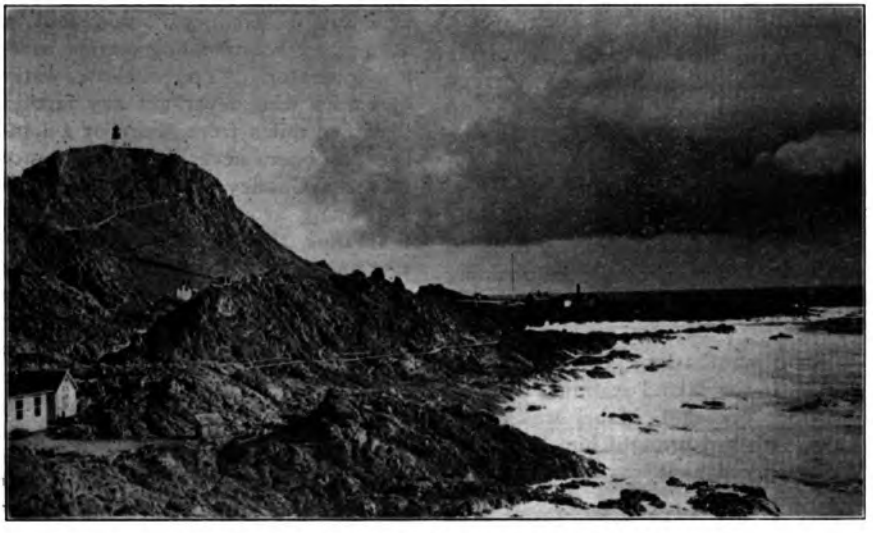
By D. R. Hollingsworth

"I don't suppose any of you fellows ever saw a 'Gooney,'" said Red, a deep water sea traveling marine wireless operator. "You shallow water operators who never get any farther than five miles from shore or a lumber schooner, never have a chance to see a Gooney because these birds only hang around deep water. The first time that my second operator saw one, he decided to take one home with him to show his folks that he was right on the job when it came to sailing the briny deep. His decision ended in results that were disastrous. Gooneys are easily caught. All that you have to do is trool a piece of meat tide to a string and when Mr. Gooney swallows the meat, line and all, the only thing left to do is haul him on deck and cut the string. The minute the bird hits the deck of the ship he gets as sea sick as a land lubber and can't flap his wings at all. The second operator caught and killed one of these queer birds and put him in the ice box for safe keeping. The Captain was a superstitious old gentleman and it soon came to his knowledge that the operator had stored the Gooney in the ice box. He always maintained that a murdered Gooney aboard ship was a sure sign of a typhoon or some disaster would eventually carry the ship to her doom.

True enough, a typhoon was encountered the same evening and the Captain, being aware of the fact that the dead Gooney was still aboard, immediately rushed to the wireless cabin, caught the second operator by the neck and stated that either the Gooney or operator goes overboard. I don't need to tell you which one went over the side but I will add that the typhoon ceased to rage as soon as the Captain's orders were fulfilled."

Thereupon a hot argument arose to the effect of the power of a dead Gooney to quiet the tempests.

The Navy Station at the Farallon Islands



A VIEW OF THE ISLAND AND STATION

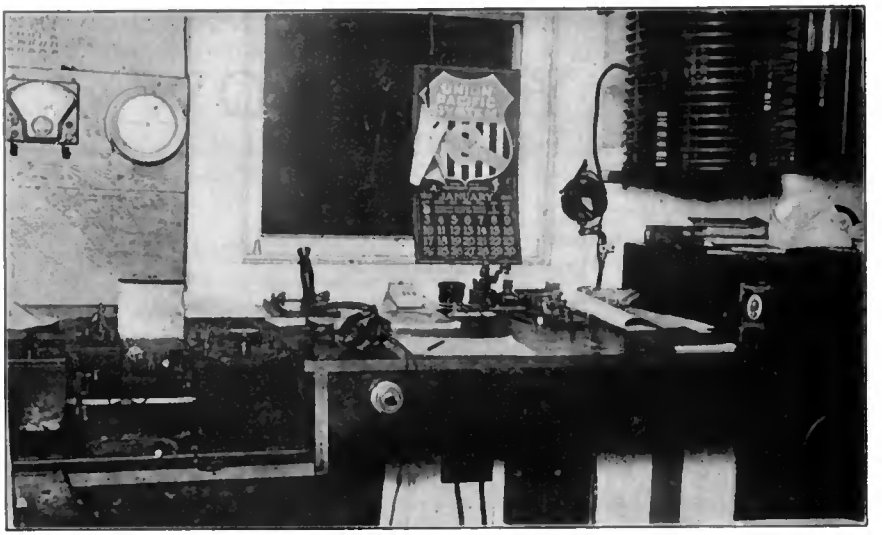
Situated about twenty-six miles from San Francisco lie the Farallon Islands. The name of the islands as well as the call letters of the station have become well known by all operators who have visited the Pacific Coast.

In former years the island was used as a lighthouse base and a fog signalling device was installed as a warning to ships in heavy weather. A cable was laid from the lighthouse to Point Reyes, some twenty-miles distant. Maritime information was telegraphed from the island to Point Reyes and thence to San Francisco or the Naval Hydrographic office at Mare Island, California. This cable was laid at a cost of over $50,000 and lasted but a few years; short lengths of the cable are still visible at various points along the shores of the islands. In preference to laying another cable to Point Reyes a radio station was erected on the largest island of the group and is used daily for the transmission of wireless weather reports to ships at sea, and also as a relay station for the navy stations at Mare Island and Point Arguello.

It might be of interest to note that the Farallon Island station is the only one on the Pacific Coast that can successfully establish daylight communication with Point Arguello, a distance of about 300 miles. The weather information from Point Arguello is first transmitted broadcast to vessels at sea, thence to the Farallon Island stations, where it is again transmitted broadcast and thence to its final destination at Mare Island.

The complement of the station is four naval operators and a cook. The cook, if he happens to possess a slight knowledge of radio apparatus and operating, is used to good advantage to work the set.

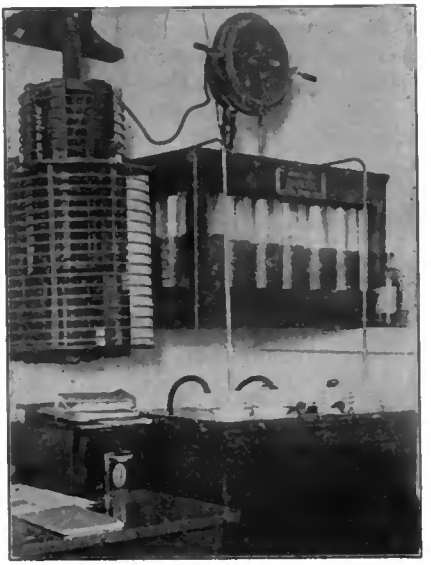
The accompanying photographs clearly illustrate the type of equipment that is employed at



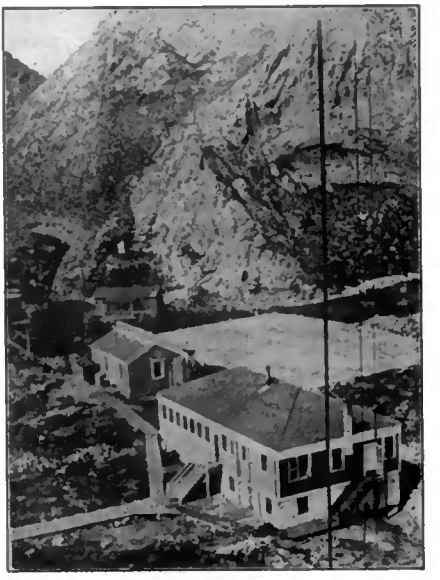
THE RECEIVING EQUIPMENT

the present time and which has given very satisfactory service. The receiving equipment comprises the standard Wireless Specialty type I. P. 76 cabinet set and a pair of adjustable magnet Wireless Specialty telephone receivers. A Telefunken receiving set is also installed at the station and is commonly referred to as the "Dutchman" by the station operators, due to the German manufacture of this type of apparatus.

(Continued on Page 133)



THE TRANSMITTER



OUTSIDE VIEW OF THE STATION

DO YOU KNOW

THAT a resistance is better than a reactance to control the power of a transformer because the resistance does not cause wave distortion?

THAT three separate transmitters are installed at Yerba Buena Island (NPG) naval station?

THAT the control for these transmitters is located at Yerba Buena Island in San Francisco Bay, while the transmitters proper (excepting a small spark set for local work) are located at Mare Island, over twenty miles distant?

THAT the use of a "smoothing condenser" and a potentiometer will permit the operation of an audion from any source of D. C. supply?

THAT one of the first audions ever used was made from a bunsen burner with two platinum electrodes held in the flame by a suitable support?

THAT any substance which contains hydrogen and which can be liberated by heat may be used, in case of emergency, in a Poulsen arc or an alcohol vapor quenched gap?

THAT a three hundred meter wavelength has a frequency of exactly one million cycles per second?

THAT distances as great as a hundred miles per watt of current consumption have been obtained by the use of small spark coils connected in the "plain aerial" manner?

THAT no satisfactory reason has ever been given for the remarkable results obtained with these coils?

THAT electromagnetic waves can be bent, reflected, polarized and refracted in the same manner as ordinary light rays?

THAT the charge and mass of a single electron has been measured with great accuracy?

THAT the mass of a moving electron varies directly with the VELOCITY with which it travels?

THAT the influence of electromagnetic waves in the vicinity of a radio station is said to effect the "direction sense" possessed by carrier pigeons?

THAT the spreaders on an antenna should never be painted, but should be carefully varnished?

THAT the German cruiser "Nurenberg" (ANU) was the only warship that established continuous daylight communication with the San Diego naval station while the cruiser was stationed in Mexican waters?

THAT the station at Madras, India, which is under the control of the British Government, is being guarded by 100 Indian troops to prevent destruction by enemy raiders?

Naval Radio Notes.

SAN DIEGO STATION OPENED.

San Diego, Cal., January 26, 1917. —The San Diego naval station, the largest radio station in the world, and recently completed by the Federal Telegraph Company of San Francisco, was opened this morning at 11 o'clock, strictly on scheduled time.

Mayor Capps and the president of the San Diego Chamber of Commerce exchanged messages with Secretary of the Navy Daniels and Congressman Kettner of San Diego. The opening of the station was attended by over one hundred people, and all messages sent and received were publicly read. The opening of the station was in charge of Lieutenant S. C. Hooper, who is in charge of the radio department of the navy; by Dr. Austin of the Bureau of Standards of Washington, and other high naval officials, who were all greatly pleased at the successful work of the station.

The Federal Telegraph Company was represented by Mr. H. P. Veeder, vice president and general manager, and Mr. L. F. Fuller, chief electrical engineer, who designed and installed the equipment. At the close of the test Mr. Veeder sent a message to Secretary Daniels, conveying his felicitations on the successful opening test.

The San Diego station is the first of a chain of powerful stations being furnished by the Federal Telegraph Company for the Government to establish communication between the trans-oceanic possessions of the United States and Washington. Other stations will be installed shortly at Pearl Harbor, Guam and Cavite. The Pearl Harbor and Cavite stations will be even more powerful than the one so successfully installed at San Diego and will be capable of communicating direct with the powerful naval radio station at Arlington, Virginia.

U. S. S. MILWAUKEE IS TOTAL LOSS—CRUISER'S SET TO BE INSTALLED AT MARSHFIELD.

The U. S. S. Milwaukee, which grounded on Samoa Beach, has been given up as a total loss. Bids have been let by the Navy Department for salving the armor and machinery of the vessel, much of which has already been removed.

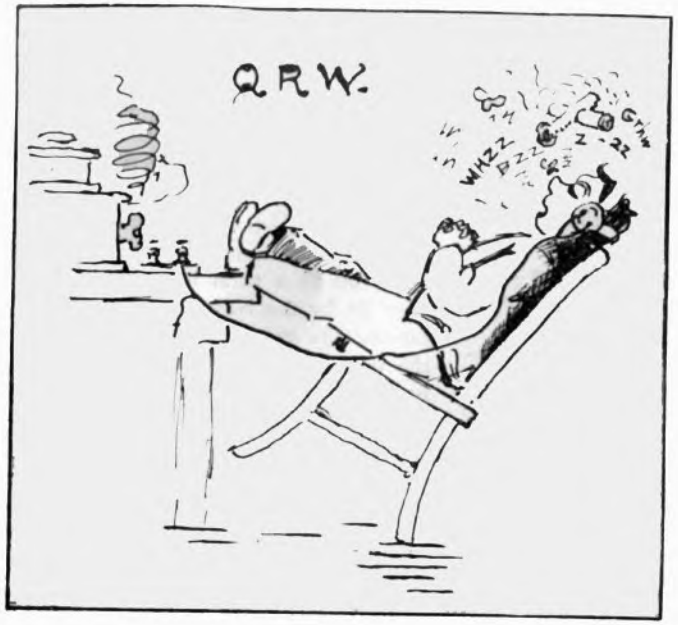
Distress calls from the grounded cruiser were received by the operator on watch at the Cape Blanco naval station, and assistance from the Samoa Beach life saving station was asked for via wireless.

The vessel was equipped with a 5 K. W. transmitter. The equipment will be removed from the vessel within due course of time and installed at the new naval radio station at Marshfield, Oregon, according to a decision made by the Mare Island authorities. The set will be installed by Mr. G. Hanscom, who supervised the construction of the Chollas Heights high power station near San Diego.

NAVY DEPARTMENT TO CONTINUE AEROPLANE EXPERIMENTS.

Information was received at Mare Island to the effect that the aeroplane radio experiments at San Diego will be continued.

Aeroplane wireless experiments were commenced by naval operators from the San Diego station about a year ago and since that time this means of communication has been greatly developed. E. J. Simon, a New York radio engineer, will arrive shortly at the aviation camp in order to perfect the aeroplane wireless service.



INTERNATIONAL ABBREVIATIONS?

BY J. L. SABO. P.R.N.

Pacific Radio News

The First and Only Wireless Magazine Published on the Pacific Coast

H. W. DICKOW, Editor
P. R. FENNER, Manager

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We are always pleased to receive interesting contributions pertaining to Radio Communication.

Photographs and good drawings are highly desirable.

We will not return manuscripts unless return postage is added.

Pacific Radio Publishing Co.
50 Main St., San Francisco, Cal.

Vol. I MARCH, 1917 No. 3

EDITORIAL

With the appearance of the third issue of the Pacific Coast's only wireless magazine, you have before you today a "Reference Book," so to speak, a magazine containing some real radio information that has not been published by our competitors. We started the ball a-rolling with our second issue, we have given it increased impetus with this issue and the April issue will start it off again with renewed energy and vigor.

We have proved every statement we made, we have convinced you that we have the real information right out here on the Pacific Coast and our numerous surprises are just beginning to assume real form.

That our periodical has met the approval of manufacturers is shown by the advertisements, compare these with any other new periodical; our magazine has met the approval of our readers, this can be shown by our large subscription list. To make a long story short, we have met success among all classes of readers. Perhaps you have wondered why the size of the magazine has failed to assume greater proportions; this will become a reality within a short time; patience is all that we ask of you. When a magazine increases its size page by page, the reader fails to notice the change but when a sudden increase of a great many pages is made, you at once become aware of the increase in size.

This is our principle, we have big surprises in store for you and will shortly issue a magazine that can really be classed as a wireless manual.

We are now offering special inducements to new subscribers, we are giving a number of good textbooks on electricity as subscription offers. This does not mean that we are doing our worst to dispose of our magazine, quite the contrary; it means that we are in a position to give you something for almost nothing and all prospective subscribers who have failed to take advantage of this offer are doing themselves a great injustice, you are fooling yourselves and not the publishers.

In regard to the Private Ownership of Wireless Equipment article that we have published in this issue we feel satisfied in stating that this article alone is worth the price of the issue. How many of our readers have seen photographs and read stories relative to the Halcun type of apparatus? It might be well to state that there are numerous corporations

in the commercial wireless field, they are all doing their share towards the rapid development of newly invented apparatus and without the competition offered by the numerous manufacturers the wireless field would not advance at a very rapid rate. Therefore, competition is one of the greatest achievements of modern times. Our readers are all aware of the fact that only one gap was left open for a wireless publication in the United States, this gap was the Pacific Coast; we have filled it and have given you something that you need most.

We are not opposing any wireless corporations, the articles published will show this; we are not aiding any special corporation, our articles again give reference to this statement.

Due to the fact that we are in favor of the new Proposed Radio Act, we do not mean to state that we have a grudge against corporations that are fighting the bill. We take a neutral stand on all matters of this character and do not fail to express ourselves as freely as we possibly can.

That the Kilbourne and Clark article was made the special feature of our February issue does not prove in any manner that we have any connection with this corporation; that the Haller Cunningham article was made the special feature of this issue also fails to prove that we have any connection with this corporation. It merely tends to show that we are going to publish ALL sides of the story and we will adhere to this principle as long as the "Pacific Radio News" will rank as an up-to-date wireless publication.

BRITISH ORDER ALL SHIPS TO IGNORE S. O. S.

(From the S. F. "Examiner")

GALVESTON (Tex.), January 22.—"S. O. S.," the wireless distress call of the sea which brings any vessel within reach to the aid of the stricken craft sending the appeal, is to be ignored hereafter, according to master of British ships arriving here, who declare they have strict orders from the British Admiralty not to respond. This order is said to be a result of German submarines using the call to trap merchantmen.

UNITED FRUIT COMPANY USES INTERESTING SYSTEM

A good account of the apparatus employed on land and aboard ships under the control of the United Fruit Company has never appeared in print. Several stories related to the operating conditions and photographs of some parts of the equipment have been published but we are going to give our readers a good account of the land and ship equipments as employed by the above named company. A number of striking photographs will make the article one of unusual interest.

PEARL HARBOR STATION TO BE BUILT SOON

The fourth high power naval radio station will be under construction at Pearl Harbor, Hawaii, within the course of two weeks.

CLASSIFIED ADVERTISERS WELL PLEASED WITH RESULTS

A number of classified advertisers who used space in our February issue have informed us that the results obtained were beyond expectation. At the rate of two cents per word we will insert your advertisement in this section. Why not try it for one issue?

RADIO ORGANIZATIONS

INSTITUTE OF RADIO ENGINEERS HEARS PAPER ON VACUUM VALVE DETECTORS

The third meeting of the San Francisco section of the Institute of Radio Engineers was held in the Mechanics Building in San Francisco, Tuesday evening, January 16th, at 8:30 o'clock.

Three papers on vacuum valve detectors were presented, one by Mr. E. T. Cunningham of the Audiotron Sales Company of San Francisco, one by Mr. O. B. Moorhead of the Moorhead Laboratories of San Francisco, and another by Mr. H. Pratt, in charge of the naval laboratory at Mare Island.

Mr. E. T. Cunningham explained in detail the theory of the new tubular valve detectors, and Mr. O. B. Moorhead read an interesting paper on the construction of the tubes. The entire process of manufacture was traced from the time that the glass tubes enter the laboratory until they are tested and made ready for shipment. Mr. H. Pratt presented a number of interesting curve sheets of various vacuum valve detector experiments that were conducted at the Mare Island laboratory.

The club room was filled to capacity and the meeting was undoubtedly the best one of its kind ever held in San Francisco.

SAN FRANCISCO RADIO CLUB CELEBRATES ANNIVERSARY

The first anniversary of the San Francisco Radio Club was celebrated at the new club room, 218 Haight St., Friday evening, January 26th, at 8 o'clock.

The affair proved to be most successful social event in the history of the club. Fifty members attended the celebration which consisted of a musical program, lectures by club members and a social entertainment. Members were well pleased with the excellent program of music that was furnished by the club orchestra, consisting of five players.

Mr. H. W. Dickow, President of the organization, delivered an interesting lecture on the development of the club from the time of its organization to the present day. His lecture was followed by interesting remarks from the following club members: Mr. S. S. Foster; Mr. C. M. Heaney, Examining Officer; Mr. R. F. Clairmont, Cartoonist of the "Pacific Radio News"; Mr. S. J. Spatafore; Mr. E. W. Radford, Asst. Secretary-Treasurer of the club; Mr. C. Reed, newly elected Vice-President; Mr. M. L. Webb of the U. S. Army Signal Corps, and Mr. Luvkin, U. S. Army radio operator of the U. S. A. T. "Logan."

A Moorhead vacuum valve detector was raffled by the club and was won by Mr. E. T. Whiting.

At a regular business meeting held on January 19th the following officers were elected for the term of 1917: H. W. Dickow, re-elected President; C. Reed, Vice-President; H. R. Lee, re-elected Secretary-Treasurer; C. M. Heaney, re-elected Examining Officer; P. R. Fenner, elected Examining Officer; S. S. Foster, elected Sergeant-at-Arms, and Mr. E. W. Radford, re-elected Asst. Secretary-Treasurer.

An installation of newly elected officers will be held on Friday evening, February 2nd, at 8 o'clock. All radio operators of San Francisco and vicinity are cordially invited to attend.

PUGET SOUND WIRELESS ASSOCIATION ELECTS OFFICERS

At the regular monthly meeting of the Puget Sound Radio Association held in December, the following officers were elected:

President, Vincent I. Kraft.
Vice-President, O. S. Van Olinda.
Secretary, E. F. Goodner.
Treasurer, C. E. Williams.

A paper on "The Measurement of Capacities" was read by Mr. Phillip D. Naugle of the Kilbourne and Clark Company, and, as is the custom, he was thoroughly quizzed in the informal discussion that followed the reading of the paper.

January, 1917, marked the fifth anniversary of this organization. Meetings are held in the Y. M. C. A. Building, Seattle.

HOW TO BECOME A PRACTICAL OPERATOR

By F. C. Reed,
V.-Pres. S. F. Radio Club

The unique and interesting method of instruction adopted by the San Francisco Wireless School cannot be too highly recommended to the interested public and amateurs throughout the state. My own experience while in attendance at the school has been so highly satisfactory and my practical knowledge increased to such an extent in so limited a time that I take this opportunity of bringing to the notice of the public this valuable institution, supplying as it does, a much needed and long felt want.

The promoters are all highly practical men and appreciate the fact that a student cannot get a grip on the higher theoretical problems of wireless unless he is first taught why and how the actual apparatus works. In the school this principle has been developed in a way that is remarkable and reflects great credit on those who have placed such unusual opportunity of acquiring this knowledge before the public.

In Mr. W. A. Vetter the school has secured the services of a really first class instructor, practical and theoretical to a degree, who, apart from teaching the principles of wireless, is continually plied with questions related to automobiles, electric machinery, hydraulics, etc., in answer to which he gives a display of knowledge that cannot be overestimated in its practical value to the student. Great stress is laid on the importance of correct sending and with the assistance of the tape recording machine it is astonishing how rapidly one's sending improves. Students are taught to send and receive messages exactly as it is done in the marine service.

Every morning we find the set out of commission and with the assistance of diagrams on the blackboard and a testing set we go to work to locate the trouble, while the competition as to who will locate the fault first sharpens one's wits and at the same time considerably improves your knowledge of the apparatus. Despite all the clever devices of Mr. Vetter to put the set out of order, we have always located the trouble and repaired it the same day.

NO RADIO CLUB LIBRARY IS COMPLETE WITHOUT A COPY OF THIS MAGAZINE

If your library does not contain a copy of this magazine, it is incomplete. You are not getting the full wireless information if you are not a reader of this magazine. To avoid missing some interesting numbers you must subscribe at once.

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Get in touch with our Business Manager and ask for our liberal agency proposition. Don't turn this page before writing for full information.

HANDY HINTS

PRIMARY WIRING.

By D. B. McGown.

[The Editor of this Department will furnish a monthly article pertaining to the operation of various radio apparatus, written in a non-technical manner so that the humblest amateur will have no difficulty in understanding them.—Ed.]

One of the most important, yet generally neglected points in an amateur station, is the wiring of the low tension primary or power circuits. As a general rule this matter is given the least thought of all in the installation of a station. On first thought it may not seem to be of any importance, and indeed, as far as the actual readings of the aerial amateur and wavemeter are concerned, no change can be noticed in spite of the various conditions that exist in primary wiring.

The real factor to be looked after in the primary wiring of a transmitting equipment is nothing more than "Safety First," to use this overworked term. It is perfectly obvious that the average amateur wiring installation does not come up to the required standard. Many experimenters are under the impression that they are thoroughly competent electricians, but an insurance inspector will undoubtedly disagree with them.

The greatest possible care should be exercised in the installation of primary wiring in any radio station, if for no other reason than the prevention of dangerous static charges of the transformer primary, as well as the danger of shocks that the operator is subject to. Another factor which should not be ignored is the insurance of the building in which the station is located; by far, the great majority of private stations are located in some room of a dwelling house, usually a bedroom or sitting-room. The house, in all probability, was wired by competent electricians, inspected and passed by the insurance inspector to conform with the rules of the underwriters. If the primary wiring of the station had been installed with the same care as the house wiring the owner of the station would possess no feeling of despair when the house or station is inspected by the insurance company. If the wiring is not properly installed the insurance policy of the building would be subject to cancellation at a moment's notice.

If a permanent station is being installed the wiring should be run in iron conduits. The uses and methods of installation of this materal are too well known among electricians and experimenters to need mention. Next to rigid conduit the best material to use is lead cable, which possesses almost all the advantages of conduit and is comparatively cheaper in price. Lead covered cable can be secured in two styles, single and duplex conductor. The duplex conductor cable contains two separate conductors, covered with rubber, an outer covering of cotton braid and enclosed in a seamless lead covering. The single conductor cable is similar in construction to the duplex conductor cable, the only difference being the absence of one conductor. Besides the above-mentioned types of wiring, the standard "knob and tube" and metal molding types must be given consideration. The use of knobs and tubes should be avoided whenever possible,

while little can be said of metal molding other than that it is about on a par with conduit.

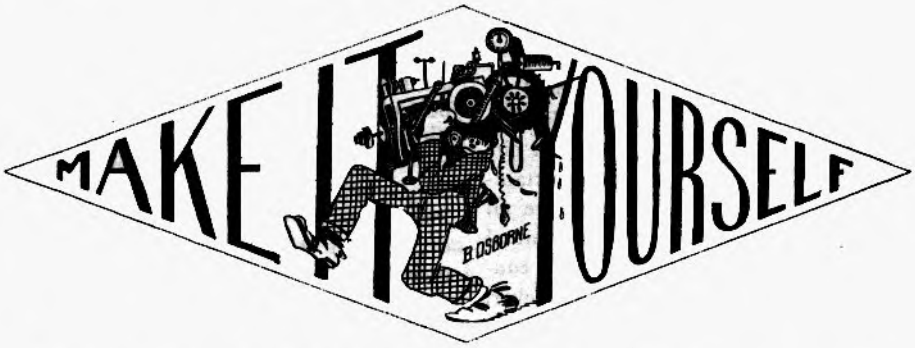
The wiring of a station should be so installed as to eliminate induction between the primary and antenna circuit. The simplest method of attaining this desired end is to encase all the primary circuit wires in a metal pipe or cover. For this reason conduit wiring is so desirable; however, the conduit wiring possesses the disadvantages of duplex lead covered wiring and metal molding wiring; there is nothing to prevent mutually induced currents in the separate conductors from acting on one another. It will readily be seen that a single strand of lead covered cable does not possess this disadvantage, due to the fact that a metallic sheathing separates the conductors. In all cases of lead sheath and conduit wiring a permanent and effective ground is necessary, preferably a separate ground from that used in connection with the radio equipment.

As a general rule it will be found that the so-called "kick-back," with which so much trouble is experienced, is not due to a "kick" or discharge from the primary of the transformer, but to the inductive effects between the antenna and house wiring proper. The inductive effects have been so great in some cases that lamps in a fixture over fifty feet from the antenna were lighted to nearly full brilliancy, yet they were in no way connected to the circuit which supplied power to the transformer primary. Conduit wiring, as a rule, will prevent this undesirable effect. The phenomena just described is rarely noticeable, but fixtures and fixture wiring have been completely ruined by kick-backs in many cases.

A very satisfactory kick-back preventer may be constructed from two high resistance graphite carbon rods, the type that are used for lightning arresters, and mounting these on a slate or porcelain base in such a manner that their ends do not quite touch a metal plate which is to be fastened between them. The free ends of the rods are connected to either side of the supply line where kick-back trouble is being experienced; the center plate is to be grounded. The action of the protective rods is self-evident; owing to their large surface they do not choke back the high frequency currents induced between the line and antenna, but allow them to flow freely and discharge them to the earth via the central metal plate, or grounded terminal. When the transmitter is in operation, sparks may be seen to jump across the gap between the ends of the rods and the grounded conductor, but no destructive arcing is allowed to take place. It may prove necessary to install protective devices in various places in the house, but their low cost, combined with the greatly increased safety factor thus attained should warrant their use in all cases where destructive induction effects are noted.

THE LATEST TYPES OF APPARATUS

Our advertising section is a course of wireless study in itself. The latest types of apparatus developed by manufacturers will be illustrated in the advertising section and should be read carefully by all readers. Whenever a new type of instrument is developed, the advertiser is the first one to announce it and place it on sale. For this purpose he uses the advertising section and does so with the ultimate desire of obtaining results from his advertisement. We request all readers to send for catalogs and patronize our advertisers. About all, do not fail to mention this magazine when writing to them.



A METAL DISC ROTARY SPARK GAP

As many amateurs are troubled by the warping of their rotary spark gap discs I will describe a unique method of overcoming this defect. The first thing to do is to obtain an old bicycle hub, remove the spokes, see that the cones are in good condition and secure a number of brass nuts to be used as lock-nuts.

The hub should then be clamped to some form of a standard and mounted on an insulating base, the exact design being left to the builder. The hub will rotate freely on the shaft as it has ball bearings. A brass disc is secured to the hum and the required number of electrodes fastened thereto. The writer prefers the type of gap with studs projecting on both sides, similar to the old Marconi type of disc discharger.

The gap can be rotated by power supplied from a motor to the hub by means of some form of flexible belting. The general construction of the gap will be left to the experimenter as no two gaps would be built alike.

THE OMISSION OF THE QUERY DEPARTMENT MEETS APPROVAL

Strange as it may seem to some readers, the omission of the Query Department has met the approval of a great number of our subscribers and readers. Of the numerous departments that have been subject to comment, the query department has been considered as a section of the magazine that fails to interest the average reader. By referring queries to the Examining Board of the San Francisco Radio Club, we eliminate them from the magazine and at the same time the questioner receives a prompt reply by mail from the above named Board.

HOW TO MAKE SWITCH POINT CONNECTIONS

An easy method of making a mechanically and electrically perfect contact to switch points is to solder the wire to the washer that is used to prevent the screw head from being forced into the panel. This method of connection is superior to the old method of soldering the connection to the screw head as it allows the switch point to be removed without breaking the leads that terminate to the receiving apparatus.

SAILING TIME OF LINER DELAYED

The "Rox Maru," scheduled to sail at 11 a. m., was delayed four hours due to the fact that the "Pacific Radio News" was four hours behind the publication time and the operator refused to sail without a copy of the magazine.

Recent Development of Radio Apparatus

A COMPACT RADIO RECEIVER

By Dr. B. N. Burglund.

The apparatus illustrated in the accompanying photograph and diagram illustrates what is known as a "Multum in Pavo," or, in plain American English, a good deal in a small space. If an extra long wave tuner, a short wave tuner, a decremeter, a wavemeter, four variable condensers, an ultra audion, an oscillator, a crystal detector, and last but not least, a good two-step amplifier and the necessary switches are placed in a hydraulic press, so to speak, the result will not be far from what the completed set represents.

Unless the builder is in a position to meet the financial conditions that this set requires, it is inadvisable to attempt the construction of this marvelous receiver. For this reason I will not go into the constructional detail to a great extent and will merely illustrate the operation of this receiver.

FRONT VIEW OF COMPACT RADIO RECEIVER

The general design of the set was prompted by the ever-increasing de-

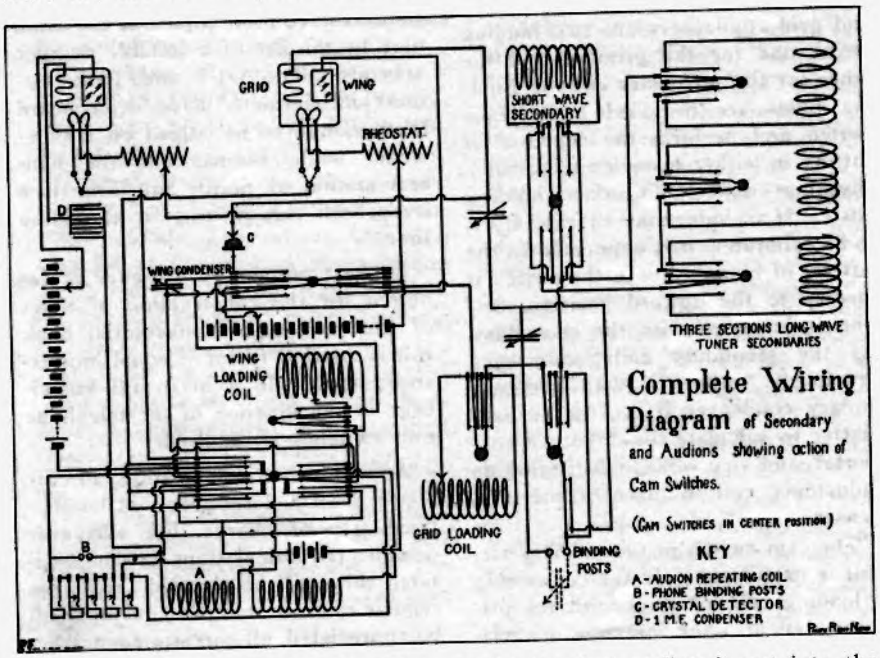
mand for apparatus that will enable the reception of damped and undamped waves. As the wave lengths employed at the present time vary from 200 to 20,000 meters, engineering practice teaches us that this extreme wavelength range cannot be covered by the use of one tuner to any degree of efficiency. For this reason I have constructed seven tuners, divided into two groups. The variometer principle is used to advantage in the construction and operation of these tuners and a very unique piece of apparatus is the result. The tuner contains one primary and one secondary, the primary winding consisting of six No. 30 D. C. C. wires wound in parallel, tapped at each turn for the first ten turns and tapped at each tenth turn for the remaining twenty taps. This makes a total of 220 taps and allows a wavelength range of from 50 to 1500 meters. The secondary construction is also very unique and revolves within the primary. The winding consists of four No. 34 D. C. C. wires wound in parallel and tapped at every fifth turn. The taps and switches are mounted on the end of the secondary and the shaft on which the secondary revolves is also used for the switch handle. An indicator, mounted on the front of the panel and with variations indicated in letters instead of numbers, is used for indicating the position of the secondary switch. A zero to maximum coupling is obtainable with this tuner through an arc of 180 degrees, and the scale can be seen mounted in the center of the hard rubber panel directly under the secondary variable condenser.

A wavelength range from 1500 to 20,000 meters is readily obtainable by means of the six primary and six secondary coils, each coil being an independent tuner in itself. The ends of the coils terminate in one of the telephone cam switches that are clearly shown near the upper end of the cabinet. The coils and switches are so connected that a series connection may be readily employed, thus forming one large tuner with a maximum wavelength range of 20,000 meters. The coils can also be used separately for shorter wavelength ranges whenever desired, as they form six complete and independent tuners with a wavelength range of 1500 to 9000 meters. To compensate for the gap in wavelength between one tuner and another a variable condenser is employed.

The two cam switches in the center of the cabinet, directly over the secondary condenser, allows a change to be made from the large to the small tuner, one switch being used for the primary changes while the other is used for the secondary changes. In the lower right-hand corner of the cabinet may be seen two circular switches with two cam switches directly under these. Two balancing inductances are controlled by means of these switches, a method similar to that employed in connection with the Armstrong circuits. Each coil is controlled by a switch which completely cuts it out of the circuit and leaves no "dead end" effects. One coil is used in the grid circuit and the other for the telephone, or wing circuit.

The center cam switches on the left side of the "Grid" loading coil appear very simple from the front view of the cabinet, but the connections employed with the use of these switches are very complicated. Three positions of the switch are used to control four circuit positions. When thrown to the extreme left position the audions are connected in the same manner as the "Armstrong Navy Hook Up" and is by far the best circuit to use in the reception of the Poulsen or undamped wave systems. When the switch is thrown to the center, or position number two, the circuits are changed so that the simple DeForest audion detector hook up

can be used and is found to be extremely efficient for the reception of highly damped signals. By cutting in the grid and wing balancing coils with the wing condenser, one of the prominent Armstrong or DeForest ultra audion circuits is permissable. Position number three, the extreme right position of the cam switch, cuts the audion out of the circuit and allows the use of a crystal detector, the bulbs. The connections used for controlling the audion circuits by means of this switch is a very complicated affair. It contains a total of eighteen blades and twenty-two connections terminate to the various parts of the switch. It took six months to enable the writer to figure out the circuits to be employed by means of this three-way switch. By throwing the switch to the extreme



changing at the same time, the telephones and cuts out the telephone or "B" battery. By means of this change the second audion may be cut into the circuit and used as an amplifier on the crystal detector.

The two binding posts under this switch are used for the purpose of connecting an audibility meter to the set and thereby measuring the audibility of the incoming signals.

Two audions are provided, the one to the right being used either as a detector or oscillator, while the one to the left is used for amplifying purposes. Both audions are controlled from the cam switch directly below right the first audion is cut into the circuit. When the switch is thrown to the center position both audions are cut out of the circuit, the "B" battery circuit is opened and the telephones cut in for use on the crystal detector. In the extreme left position, as shown in the photograph, both audions are cut into the circuit, the first audion may be used either as a detector or oscillator, the second audion as an amplifier and the telephones transferred to the second audion.

Two audion "A" battery rheostats are shown on the left-hand side of the cabinet, each audion filament be-

ing controlled independently from the same storage battery, but the use of two sets of "B" batteries is necessary for obtaining the best results. The two binding posts at the lower left-hand corner are for the auxiliary "B" battery for amplification use, such as used for the Pliotron and other amplifiers using more voltage than the capacity of the "B" battery already installed. On the extreme left and right-hand sides of the wing and grid condensers are two binding posts, one for the primary and the other for the secondary circuit. Binding posts are provided under each switch and perform the function of cutting in, either in series or parallel, anything connected to these binding posts. If an inductance or capacity is to be calibrated, it is connected to the left set of binding posts, the switch is thrown to the upward position, cutting it in series with the secondary. As the secondary coils have been previously calibrated with the secondary condenser it is now an easy matter to calculate the unknown condenser, and vice versa, substituting an inductance coil in place of the condenser.

The cam switch in the primary circuit is useful not only for connecting a loading coil in series with the primary, but also for inserting a variable condenser in series with the circuit for the reception of short wavelengths when a large aerial is employed.

By means of telephone plugs any number of telephone receivers, up to five, may be connected to the set by plugging them into the holes shown in the lower left-hand corner of the cabinet.

The general efficiency of the set is indeed very great. It allows the reception of standard navy wavelengths without necessitating a great number of changes in inductance and capacity and the change from damped to undamped wave reception is made an easy matter by the convenient arrangement of the cam switches. The advantages of the use of a crystal detector is also one of worthy mention.

By means of the peculiar arrangements of the large inductances the selectivity is so great that any of the Atlantic Coast stations can be copied through Bolinas, South San Francisco or the Marconi station in San Francisco. The German and Japanese stations have been copied at the same time by the use of a suitable number of coils. The OUI and POZ stations in Germany have been heard loud enough to be copied on a typewriter while Bolinas and the Federal station at South San Francisco were both transmitting at the same time.

A great amount of patience is required for the construction of a set of this kind and a substantial bank roll is another factor if equal importance; above all, a masterful knowledge of the function of the telephone cam switches is required.

Any information relating to the above described receiver will be supplied free of charge, but whenever complicated calculations are necessitated they will be charged for at the regular rate. A stamped envelope will be appreciated, all correspondence being addressed to B. N. Burglund, care Pacific Radio News.

MR. S. S. FOSTER IS CHECKER CHAMPION

"I defy them all," says Mr. S. S. Foster, the wireless checker champion of San Francisco. He has been successful in winning every wireless checker game played by members of the S. F. Radio Club.

Arrangements for playing these games via wireless can be made by addressing the champion, 3452, 16th St., San Francisco, Cal.

THE FARALLON STATION

(Continued from Page 117)

The transmitting set comprises a 10 K. W. open core transformer, although the power input seldomly exceeds the one kilowatt mark. The leyden jar condenser consists of the Wireless Specialty flat bottom copper coated jars and is shown suspended on the wall near the oscillation transformer. The rotary gap is of peculiar construction and is worthy of special mention. It consists of an oscillating fan motor with a home-made rotor attached thereto, the fan motor proper revolving to and fro when the current is supplied to the motor.

Ship operators have been successful in copying signals from the Farallons at some points along the Mexican coast. This is exceptionally good work as the input of the transformer did not exceed one kilowatt.

The nightly press that is transmitted from local stations is copied by the operator on watch and a copy is supplied in typewritten form to each of the ten families scattered about the islands. The lighthouse keeper's boy acts as the newsboy and delivers the morning papers to their destination.

In order to obtain permission to visit the island it becomes necessary to receive a pass from the Custom House authorities and only in exceptional cases are these permits granted.

The lighthouse tender "Sequoia" makes a trip to the islands every two weeks in order to deliver the supplies that have been requisitioned by the inhabitants of the island via wireless. As a general rule the tender arrives on Friday mornings and lies at a point of about a half mile from the boat landing at the island. The supplies are lowered into small boats from the tender and thence to the landing where they are hoisted onto a small railroad car by means of a steam winch. The railroad tracks run directly to the station and are used to handle the heavy machinery that is used for various purposes by the wireless and lighthouse authorities.

In the event of an operator desiring to take a trip to San Francisco it becomes necessary for him to row a short distance to sea in a small boat and hail a nearby fishing vessel that is bound for the city. The oarsman then returns to the island and awaits his turn to visit the city.

Landing Supplies Under Difficulties

The station house is of ample size to comfortably accommodate the operators of the station. Each operator is furnished with a large sleeping room and other necessary accommodations. The Chief Operator enjoys the special privilege of a cozy bungalow and stands a regular watch at the station.

Rabbit hunting is popular sport on the island and it is often possible to shoot them from the station windows.

The aerial mast is of wood construction and is securely guyed by steel cables. A 30-foot spreader supports the six-wire aerial that runs to an insulated terminal on a nearby hill. The mast and station house is clearly illustrated in one of the photographs.

A 40-cell storage battery supplies current to the transformer through a mercury interrupter. A large gas engine is also installed at the station but is only started in case of necessity.

The operators seem well satisfied with their berth at the station and as a general rule the applications for a position at the station are many.

ALASKAN POSTMASTER USES WIRELESS IN HANDLING MAIL

(Continued from Page 101)

by me and I boarded the first wireless equipped steamer that made Skagway a port of call. The operator supplied me with a small piece of silicon, and with the use of an ordinary telephone receiver I was enabled to copy the signals from the steamer at a distance of five miles.

An aerial was erected, consisting of six wires about 180 feet in length and suspended between masts about 70 feet in height. A complete transmitting set was installed at a cost of $500 and enabled me to communicate with Juneau, a distance of about 100 miles. My present aerial consists of a single wire, 500 feet high at one end and 40 feet at the other. The side of an adjoining mountain, 500 feet in height, is the common support for the high end of the aerial. A Thordarson I K. W. transformer, a rotary gap, a glass plate condenser and oscillation transformer constitute my present sending equipment. For receiving I use an audion detector, Wireless Specialty receivers, and a combination of various other types of receiving apparatus. Signals from Honolulu and Bolinas have been copied without difficulty and steamers as far south as Cape Flattery are distinctly heard at night.

SOME INTERESTING FACTS BROUGHT TO LIGHT

Few of us have heard the full account of the story connected with the establishing of wireless communication between the Greek steamer Thessaloniki and the Revenue Cutter "Seneca." The Thessaloniki sailed from Piraeus, near Athens, on October 29, 1915, with a large general cargo and over two hundred passengers. A heavy gale was encountered several days out and engine trouble soon developed. The Captain of the ship refused to grant permission to the operator to send an S. O. S. call after being requested to do so by the officers of the vessel. As a gale increased in fury the officers again demanded that the distress call be sent but the Captain again refused to send for help. The Purser, Chief Officer and Chief Engineer ordered the wireless operator to send the call, signed by the three named parties. The call was sent and a reply from near-by vessels was soon received. The Captain, being aware of the fact that a call had been sent, threatened to shoot the operator and undoubtedly would have done so were it not the operator's fortune that the Chief Engineer happened to be standing near the wireless cabin at the time and snatched a revolver from the Captain's hand. He threw the weapon overboard and threatened to do likewise to the Captain if he interfered with the further dispatch of distress calls.

ANOTHER LAND STATION ARTICLE IN THE NEXT ISSUE

The navy station at the Farallon Islands has been described in this issue and our April number will contain another short station article. As previously stated, we will publish a monthly article relative to the operating condition of all land stations on the Pacific Coast and we have already proved this statement to a marked degree by the publication of several and station articles. Each article will be illustrated with clear photographs and interesting information relative to the operation of the station.

For the benefit of our readers who do not contemplate on binding their copies, we would suggest the purchase of a photograph album for the insertion of all land station articles published in this magazine. We feel satisfied in stating that the publication of a series of land station articles has never been successfully carried out by other radio publications and think the scheme an ideal one in all respects.

FROM SAYVILLE TO JAPAN

The "Pacific Radio News" is read monthly. It is considered to be the best wireless publication by all classes of readers. This is an accomplished feat of no little importance and goes far to prove our statement that we will publish articles that can be read with equal interest by all.

ANYTHING TO PLEASE OUR READERS

We have been slightly disappointed by the lack of correspondence from our readers in regard o the commenting on various departments of this magazine. Unless we receive criticisms from our readers we can only publish articles that suit our requirements.

Classified Advertisements

Advertisements in this section are 2 cents per word net.

Remittance, in form of currency, money order or stamps must accompany copy.

Advertisements for the March issue must reach us no later than February 1st in order to insure classification.

In counting words, count name and address.

Figures count five to the word in one group.

The "PACIFIC RADIO NEWS" being the first and only wireless magazine published on the Pacific Coast on radio engineering and operating subjects and not being connected with any wireless company or corporation, which might influence in any way its editorial policy, enjoys a select circulation, exceeding that of any other publication of its kind.

It will pay you to try an advertisement in this section.

PACIFIC RADIO PUBLISHING CO., 50 Main St., San Francisco, Cal.

WIRELESS

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$12.00 Step-down transformer $3.00
$ 7.00 Moorhead tube $2.50
$ 3.50 Stationary gap $2.00
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FREE!!! FREE!!!—We have a few of the latest type double filament Electron Relay bulbs which we will offer to any amateur at $2.95 each, or 3 for $8. Radio oil immersed variable $4.75 condensers only $3.50, or one FREE with 6 bulbs. Buy UR FORMICA PANELS and genuine mahogany cabinets from us at low prices. Radio High Tone Gaps, 1 K.W., $9.75. Turney 3000 ohm $7.50 fones only $6.68. Get our wonderful offer on the new MIGNON cabinets, ask for catalogue and circulars. Mid-West Wireless Supply Co., Mattoon, Illinois.

BARGAINS in radio apparatus. Transformer reactances at remarkably low prices. Specially selected Galena crystals 20 cents per ounce. Specifications for constructing radio and electrical apparatus furnished. Ask for prices and full information. Radio Bargain House, 1247, 47th Ave., San Francisco, Cal.

THORDARSON TRANSFORMER, ½ K. W., good condition, $12.50. N. Hueter, 1434 Jones St., San Francisco, Cal.

....ELECTRON RELAYS, latest type. Also a full stock of panels, switches, rheostats, batteries and other audion material. Send for price list and enclose stamp. Electron Agencies, 4608, 18th St., San Francisco, Cal.

FOR SALE—No. 5 Omnigraph complete with key and buzzer. Almost new. Price $5.00. J. Wyman Gaffney, Box 288, Stanford University, California.

ELECTRICAL BOOKS

We have received a limited number of electrical books that should be in every radio station. As the supply of these books is limited it will be necessary to order at once.

Alternating Currents Simplified.
By E. E. Burns, B.S.....$1.50
Electricity at High Pressures and Frequencies. By H. L. Transtrom....$2.00
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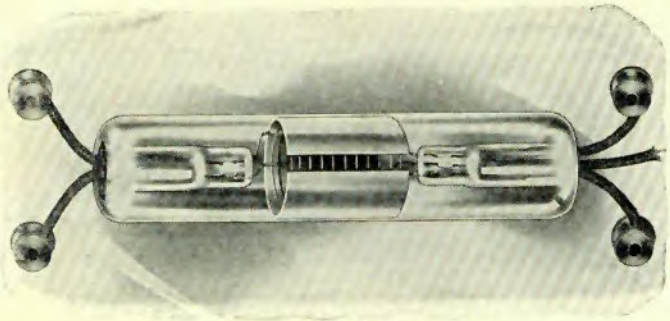

Patent Applied For

The Audiotron has smashed all records—Seattle copies OUI in daytime with one tube. Your receiving range will be more than doubled if you equip your station with the genuine AudioTron—not imitations.

The internal action or mode of operation, not the mechanical structure, determines the quality and sensitiveness. The AudioTron differs from all other bulb or tubular detectors since it utilizes the variations, produced by the impressed grid potentials, in a pure electron flow from negative incandescent tungsten to a cold positive plate. Its operation, in no way, utilizes a sensitive gaseous medium.

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