



FEBRUARY, 1917

TEN CENTS

IN THIS ISSUE

Kilbourne & Clark
Win
Marconi Suit

The Glorious Days at Old "PH"

First and Only Wireless Magazine published on the Pacific Coast

Announcement



The Moorhead Laboratories, Incorporated, wish to announce that they have taken over all interests of the Pacific Research Laboratories. The Moorhead Laboratories, Inc., are equipped with high grade machinery and apparatus for any of the following work :

Scientific Glass Blowing.
Experimental Lamp Construction.
Evacuation of Vessels.
Production of Extreme Vacua.
Designing, Constructing and Installing of
Radio Telephone and Telegraph Equipment.



WE SOLICIT YOUR INQUIRIES



MOORHEAD LABORATORIES

Incorporated.

Office and Factory, 165 Jessie St.

Telephone Sutter 1945

San Francisco, Cal.



BIG THINGS AHEAD--

for men who are determined to succeed

One of the finest Radio Schools in America is now being installed at Heald's Engineering School---the equipment will be the last word in Radio--nothing better in the world--ask for full information--

Heald's Engineering School

1220 Post Street

San Francisco

Note the Contents on the Opposite Page



COMPARE THESE WITH THE CONTENTS OF
OTHER WIRELESS PUBLICATIONS.

HAVE YOU SEEN ANY OF THESE ARTICLES IN
OTHER MAGAZINES?

THE ARTICLES MAY BE FEW IN NUMBER BUT
WE BELIEVE THAT QUALITY COUNTS.

WE PUBLISH NEWS PERTAINING TO THE DE-
VELOPMENT OF ALL WIRELESS CORPORATIONS.

OUR EDITORIAL COLUMNS ARE NOT PREJU-
DICED BY AFFILIATION WITH ANY COMPANY OR
CORPORATION.

WATCH FOR FUTURE ISSUES AND MAKE THE
FINAL SUMMARY YOURSELF.

YOU ONLY HEAR ONE SIDE OF THE STORY IF
YOU ARE NOT A READER OF THIS MAGAZINE.

Pacific Radio News

A Monthly Magazine of Radio Communication

Published by the Pacific Radio Publishing Co.

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

D. B. MCGOWN..... Asst. Editor
 L. O. FASSETT..... Asst. Editor
 E. W. RADFORD... Asst. Manager

Volume I

FEBRUARY, 1917

No. 2

Contents

Cover Design	J. L. Sabo
Kilbourne & Clark Win Marconi Suit	54
The Glorious Days at Old "PH"	56
U. S. S. Saturn to Sail for Alaska	61
Haller Cunningham Company Closes Important Contracts	61
Electric Condensers for Producing High Frequency Alternating Currents, by Dr. B. N. Burglund	62
The Wreck of the "Fort Bragg," by M. W. Haub	64
Ravings of a Navy Radio Electrician	65
Heard Above 200 Meters, by R. F. Clairmont	66
Life of a Warship Operator	67
Handy Hints, by D. B. McGown	68
Do You Know That	70
The Midnight Wireless Call, by Ray Diamond	71
Editorial	72
Radio Organizations	75
Recent Development of Radio Apparatus	77
Make It Yourself	80
When An "S.O.S." Came True	84
Classified Advertisements	87

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.

All forms close on the first of the month preceding date of issue.
 Published Monthly by the Pacific Radio Publishing Co.,
 50 Main St., San Francisco, Cal.

Subscription \$1.00 per year in the U. S.—\$1.50 Foreign. Single copies 10 cents

Copyright, 1917, Pacific Radio Pub. Co.

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



FEBRUARY, 1917

Congratulations From All Parts of the Country

The initial issue of our publication has met success, it was a great surprise to the entire wireless public; it was received with open arms by thousands of wireless enthusiasts in all parts of the world. Hundreds of congratulatory letters have been received, wishing us the best of success and urging us to keep up the good work in order that we may publish the best wireless magazine in the United States. This is just what we expected; we tried hard to please our readers and we now feel satisfied that our magazine has accomplished all that we have claimed. Amateurs and Commercial operators alike are boosting this magazine regardless of its small size.

We believe that quality counts, quantity is only a matter of secondary consideration. It is our desire to keep the standard of this magazine far above that required by the average reader and the many congratulatory letters received go far to prove this statement.

You have before you today the second issue of the "Pacific Radio News;" it is just a little better than the first and the third issue will contain a few articles that will make it an issue that will never be forgotten by the readers of our magazine. We wish to express our desire of having every reader become a subscriber, for our own benefit as well as yours. You are not taking a "Gambler's Chance" when you subscribe, you are investing your dollar in a sound proposition, in a publication based on facts and you are helping us to publish articles that have never been published before.

Do not worry about the quantity of good articles that we can publish, we assure you again that the Pacific Coast is overflowed with the best wireless material and we will show you that the "Pacific Coast will find its place in the sun," as one of our readers states.

We thank you one and all for your hearty support.

THE PUBLISHERS.

A FEW OF THE CONGRATULATORY LETTERS RECEIVED

Enclosed find \$1.00 for my subscription to your magazine. Allow me the pleasure of congratulating you on your efforts, and rest assured that we amateurs are behind you all the time. I believe the old "Pacific Side" will show upon the wireless horizon quite prominently in the near future.

H. C. MACQUARRIE, Pres. San Joaquin Valley Radio Assn.

A copy of the "Pacific Radio News" was thankfully received. I wish to congratulate you upon your success in producing a periodical so interesting in contents and elegant in appearance. I will be glad to do my best in order to promote the success of the magazine. I wish you and your associates the best success.

J. L. SABO, San Francisco, Cal.

The first issue of the "Pacific Radio News" on hand. I can truthfully state that your magazine is the neatest, most interesting and best appearing magazine on Radio Communication in the United States.

C. L. P., New York City.

I received the copy of "Pacific Radio News" and think it is fine for the first issue. I am enclosing a money order for my subscription. I think that your paper will stir up the Seattle and Everett amateurs, as wireless has seemingly died in this district.

A. S. KELLER, Seattle, Wash.

Great Patent Infringement Case Is Decided In Favor Of Kilbourne & Clark Co.

Marconi Co. Loses Hard Fight Against Seattle Manufacturers

(From the "Post-Intelligencer," Dec. 12, 1916. Courtesy of F. G. Simpson,
General Manager, Kilbourne & Clark Mfg. Co.)

The Kilbourne & Clark Manufacturing Company won the suit brought against it by the Marconi Wireless Company of America for alleged infringement of patents claimed by the latter company before Judge Neterer in the federal district court yesterday.

The result of the decision is to establish that none of the commercial apparatus manufactured by the Kilbourne & Clark Manufacturing Company infringes the patents of the Marconi Company, which is now installed on approximately 125 steamships, as well as at a large number of land stations on the Pacific and Atlantic seaboard and the Great Lakes, and pending orders for which in this country and abroad now exceed more than half a million dollars.

Asked Million Dollars

The Marconi Company brought its suit more than a year ago, alleging infringement of the Lodge patent, so-called, of which it claimed ownership, and also of a certain Marconi patent, both of which involved radio apparatus. The plaintiff company set its damages at \$1,000,000 and asked that the defendant company be temporarily enjoined from manufacturing any of its radio equipment.

Following the suit brought in Seattle, suits were also brought by the Marconi Company against the defendant company in Buffalo and Brooklyn,

N. Y., and the plaintiff company was about to bring suits and apply for injunctions in Portland, Me., Chicago and San Francisco, when it was enjoined by Judge Neterer from proceeding any further suits until that brought in Seattle was decided.

Twelve Weeks of Trial

The trial of the case then proceeded and required twelve weeks for the reception of the evidence, several sessions of the court being held in the plant of Kilbourne & Clark Manufacturing Company to better enable the experts to explain to the court the radio apparatus alleged to have been infringed.

The Lodge patent expired three days after the suit was begun, so was not an important issue in the case. The validity of the other patent claimed by the Marconi Company was challenged by the Kilbourne & Clark Manufacturing Company.

Judge Neterer's Decision

Judge Neterer, in his decision covering nearly fifty pages filed on Monday, found that the Kilbourne & Clark Company manufactured three standard types of radio apparatus, known as the Simpson transmitter, the Thompson transmitter and the Standard receiver, and all of these types of apparatus were held noninfringing. The apparatus installed on the steamship Alameda was the first and only

set of its type, and, therefore, held an infringement.

The court further held that it has no jurisdiction to inquire into apparatus manufactured for the United States government under government specifications and contract, as the United States court of claims had exclusive jurisdiction over all actions for infringement against the United States or its employes or contractors.

Government Sent Experts

The government showed its interest in the suit in allowing several of its radio engineers to appear as witnesses for the defendant company, the government's interest in the case, it was explained, being to break the Marconi's monopoly of wireless apparatus.

A deposition was introduced during the trial of the case from inventor Marconi, the deposition having been obtained after a three months' search for him in the European war zone. Other witnesses who testified were F. M. Waterman, patent expert of the Marconi company; R. A. Weageant, chief engineer of the Marconi company; F. G. Simpson, general manager and chief engineer of Kilbourne & Clark Manufacturing Company; Benjamin Wolfe, United States radio inspector; R. E. Thompson, sales manager of Kilbourne & Clark Manufacturing Company; E. W. Stone, United States radio inspector; V. Ford Greaves, radio engineer United States department of commerce; F. A. Kolster, chief of radio division of the United States bureau of standards; Greenleaf Whittier Pickard, patent expert for Kilbourne & Clark Manufacturing Company; Dr. Jonathan Zenneck, of the University of Munich, Germany, and leading text book writer, and a number of operators. A number of depositions of Eastern experts were also read in evidence.

Point of Decision

Judge Neterer, after reviewing the testimony and authorities submitted during the trial, holds that the ques-

tion is neither one of efficiency nor selectivity, but that the issue is infringement; that the mere fact that the same result is obtained by the operation of an apparatus is not conclusive of infringement.

The apparatus complained of, Judge Neterer holds, is fundamentally different from the Marconi apparatus.

As to the Alameda infringement, Judge Neterer rules that unless the parties can agree as to the amount of damages, he will refer the question for the ascertainment of damages to a master.

An appeal from the decision of Judge Neterer will be taken to the United States circuit court of appeals and it is expected that the appeal will be entered for argument at the coming February term.

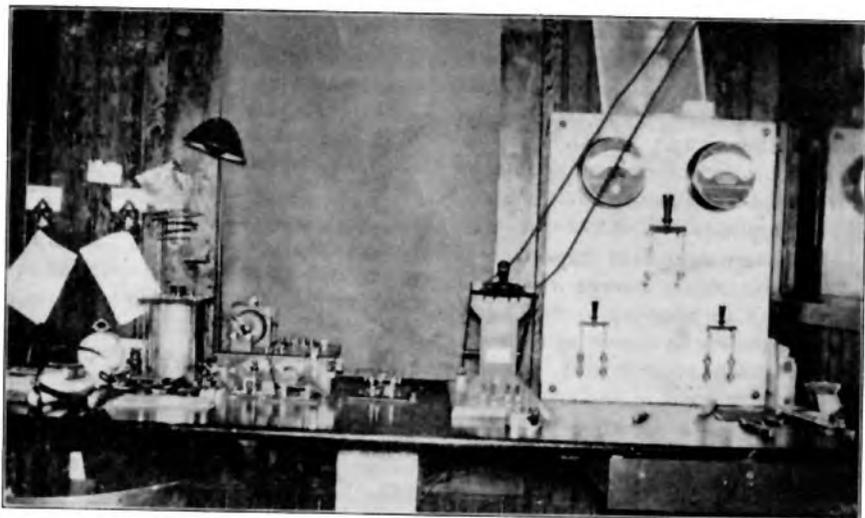
Former Federal Judge George Donworth and E. L. Skeel, of Seattle, and Philip Farnsworth, of New York City, appeared for the Kilbourne & Clark Manufacturing Company, and the Marconi Company was represented by Sheffield & Betts and J. J. Cosgrove, of New York City, and Peters & Powell and E. C. Hughes, of Seattle.

Sought Advice Before Manufacture

E. L. Skeel, who directed the trial of the case for the defendant company, last night said:

"We are naturally pleased with this decision. It constituted a vindication of the Kilbourne & Clark Manufacturing Company. Before entering into commercial business the company asked for unbiased opinions from the best experts obtainable, who united in declaring that the Kilbourne & Clark apparatus was both efficient and non-infringing. The decision was based on the weight of evidence and will command respect from lawyers and engineers alike. Since the close of the testimony a number of important patents on radio apparatus have been granted to F. G. Simpson, chief engineer of the Kilbourne & Clark Manufacturing Company."

The Glorious Days at Old "PH"



AN INTERIOR VIEW OF THE OLD UNITED WIRELESS STATION
IN SAN FRANCISCO (PH)

HOW THE CALL OF "PH" ORIGINATED

Wireless telegraphy made its debut on the Pacific Coast during the summer of 1904. The first wireless station on the Pacific Coast was established by the DeForest Wireless Telegraph Company, and was located in the old Palace Hotel facing New Montgomery street. Mr. Tim Furlong was assigned operator in charge of the station and it was this operator that assigned the call of "PH" to the station. The call was derived from the first letters of the words Palace and Hotel and it has become known in every part of the world. Many are the tales that are told by the "Old Timers" who operated the station in these days; many times has the station made a name for itself that will go down forever in the history of wireless.

The call has been changed from PH to KPH, the change taking

effect at the time that the Radio Law was enforced. Nevertheless operators still refer to the station as "PH" and it is doubtful if this expression will ever be forgotten.

During the fall of 1906 the old DeForest station was dismantled and the company established its new quarters in the Union Trust Building. A new company was formed, known as the Occidental and Oriental Wireless Telegraph Company.

The progress of the newly formed company was slow, due to the fire of 1906 which destroyed the building and the greater part of the business district of San Francisco.

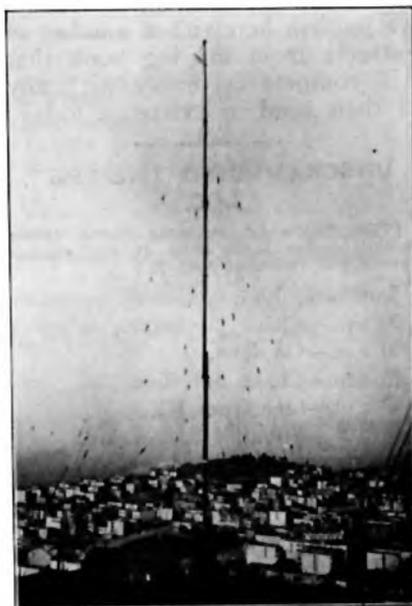
NEW STATION OPENED ON RUSSIAN HILL

This newly formed company immediately undertook the construction of a new station and Russian Hill was chosen as the best location for the station. Res-

idents of Russian Hill soon complained of the unbearable noise of the straight spark and the induction received in the telephone which was so strong at times that telephone communication was an absolute impossibility. The removal of the station was ordered and a new station was erected in Daly City. The Russian Hill station remained closed during the years of 1907 and 1908 and the Occidental and Oriental Wireless Telegraph Company was absorbed by the United Wireless Telegraph Company, which in turn was later absorbed by the Marconi Wireless Telegraph Company of America.

The United Company at once launched a vigorous campaign on the Pacific Coast in order to carry on commercial telegraph communication by means of wireless telegraphy. The ground on which the Russian Hill station was constructed was leased from the city, the accompanying photograph clearly illustrating the

ent of Construction, who was aided by Mr. C. E. Cooper, Division Manager and Jess Schwitzer, Chief Operator, Mr. Tim Furlong



THE AERIAL AND STATION AT OLD "PH"



A GROUP OF "OLD-TIMERS" WHO WORKED "PH"

The sign bears the inscription: United Wireless Tel. Co. Commercial Kisses Received Here

ideal location for a wireless station. The construction of the station was supervised by Mr. Oscar Brill, later succeeded by Mr. G. A. Robinson, Superintend-

was the only operator employed at the station.

The pioneer operators who entered the commercial wireless service were William Chaddock and J. J. McGasbey. On March 19th, 1908, Tim Furlong was relieved by J. O. Watkins, the former being assigned to the Union Oil Barge No. 3, now known as the Standard Oil Barge 93 and was the first vessel equipped with United Wireless apparatus on the Pacific Coast. The barge was under the command of Captain Alexander Ruckwood.

LOG BOOK IS INTRODUCED

The use of a station log book was introduced by the pioneer operators who employed their spare time to advantage in writ-

ing humorous articles and poems in the book. Few of us indeed have been fortunate enough to glance through one of the logs and for the benefit of our readers we publish herewith a number of extracts from the log book that will compete favorably with any of their kind in existence today:

UNSCRAMBLING THE "PH" LOG

[The following extracts were taken from the log book kept at the station during the years of 1911-12.]

June 4th, 1911.

- 6:20 a.m.—Clean out shack.
7:00 a.m.—On fone.
7:45 a.m.—Chase out flies.
7:47 a.m.—One from NX.
7:48 a.m.—Flies all back again.

The night was dark,
The static was bad,
The power went off,
GEE,—I was glad.

WHEN THE STATION BROKE DOWN

3:05 a. m.—NPH calls SF down for butting in on Navy. Tuner on blink, think aerial is leaking also. Expecting "Experts" any minute to arrive and repair set.

3:30 p. m. to 6 p. m.—Out of commission account "Wireless Wizards" working on plant.

A BLANK PAGE IN THE LAWG BOOK

Been on bum for two days making repairs to station. Log book covered with wire, screwdrivers, hatchets, hammers, blow torches, etc.

4:10 p. m.—NI starts sending me a message, can't get half of it, he is such a rotten sender.

4:15 a. m.—PM starts sending. God knows when he finished, he was still going when last I heard of him.

Recalling the days of "Bugs" Mc-

Carthy, the Wireless Telephone Capatist in the Metropolis Bank Bldg.

9:55 p. m.—"Bugs" in with his fone, stronger than usual. Try to get GW but can't hear him thru fone, CURSES !!!!

There's a station way down on the beach,
The noise it turns out is surely a peach.

The Opps tear their hair,
They cuss and they swear,
But Old Poulsen he sticks like a leach.

The operators at PH were great poets, as will be shown by some of the following poems:

He worked Second at PH
One long month and a day,
"LM" was tickled when he came,
Likewise when he went away.

'Twas he that smoked the cigarette,
'Twas he that passed the "buck",
You'd thought he was the finest yet
From the way he led you up.

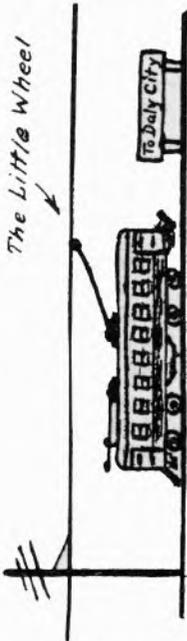
Morse or Continental,
He left it to their whim,
The C. Q. D.'s of twenty ships
Could howl for all of him

"LM"

"LM" once handled the great PH,
Is what I have been told,
He did his work, he'd never shirk,
And now he's the chief quite bold.

MR. E. D. STEVENS GETS NEW TITLE

The title of Superintendent of Construction has been conferred upon Mr. E. D. Stevens of the San Francisco Construction Department. He held the title of Foreman of Construction for several years, his new title taking effect on Nov. 15th.



"I don't understand how it is that the little wheel at the end of that long arm gets enough grip on that wire to push the car along"



Showing how the average "PH" operator looks

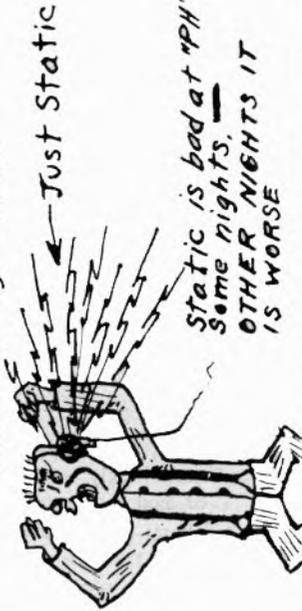
No. 14683

Seattle National Bank

Pay to Any Good Operator
 Five and 25/100

Not over Ura muutt
 \$10.00 CASHIER

The Wire less Man's dream
 His monthly check.



Static is bad at "PH"
 Some nights, —
 OTHER NIGHTS IT IS WORSE

WHEN PH WORKED JAPAN

Scene: Two operators wandering about the Crocker Tract.

Time: January, 1920.

One operator suddenly finds a piece of paper with strange hieroglyphics inscribed thereon.

"Heavens," he cried, "it must be the writing of an ancient race."

The other operator, an old timer, looked long and intently on the strange document, and looking up with a grunt of disgust, he remarked, "Naw, that's only one of Shaw's copies of a Jap message."

(Shaw was the operator at the station.)

1:50 a.m.—"TG" is very persistently, maliciously sending some of last month's press.

5:40 a.m.—Every kid in town in.

5:50 a.m.—Static very bad, "LM" made a remark at the office the other day to the effect that my nightly reports on static were all a bunk. I'd give him my my next pay check if he could do as much as clear NPH thru this static.

8:30 a.m.—The combined forces of 3000 ham factories are bursting forth with their weird codes upon the quietude of this lovely rainy morning.

9:40 a.m.—UG & UK in, can't work them 'cause I got an arc in now and it goes zowie, zowie-e-e-e—

5:15 a.m.—Dominion people in.

7:00 a.m.—Juice off.

7:30 a.m.—Juice back with honors.

SAD STORIES THAT WERE RELATED

"This is a sad case," said the Asylum attendant, pausing before a padded cell. "There is no hope whatever for this patient."

"What's the trouble with him?" asked the visitor.

"He once worked at PH thru the static season," he answered.

EPITAPHS THAT ARE COMMON IN THE "BRASS POUNDERS" GRAVEYARD

Rest in pieces.

Here lies George Hubbard.

Born May 1st.

Died Aug. 4th.

Rheumatic but Lively.

Addicted to the use of

Non-alcoholic Stimulants, a habit learned from Shaw.

Remains shipped to China.

"PH"

In his little rock-bound office

Thru the gloomy hours of night,

Sits the wireless operator

From eve till morning light,

Watching close with sharpened hearing

What the sparks thru static say,

Cursing fate and Jack McCarthy

And weak signals far away.

THE GREAT TRAGEDY ABOARD THE STR. "WASHTENAW"

Characters: Captain Scratch.

Operator Voltampwatt.

Time: 7 a. m.

Captain: Did you get the "US" last night?

Operator: No, sir, could not raise her.

Captain: We met her half a ship-length off at 5 a. m.—

Operator: Well, sir, I had no juice.

Captain (to Mess Boy): Here, boy, go get this Swab a bucket of volts and amps mixed and see if we can get him to do some work.

(Half hour later, boy returns with the mixture.)

Captain: Hey, Sparks!!!! Wake up!!!!—

Operator: Huh?

Captain: What did you do with that bucket of juice?

Operator: Hove it over the side.

Captain: You can pack your other shirt and beat it at Oleum, you're fired.

Operator: Yes, sir (proceeds to send relief message and looks for his other shirt).

U. S. S. SATURN, THE "WIRELESS SHIP," TO SAIL FOR ALASKA SOON

By Our Mare Island Correspondent

A modernization of the Navy Radio System in Alaska will be carried out during the early part of this year, when the U. S. S. Saturn will sail for Alaskan ports with 100 Naval Experts aboard. A combined sum of \$187,277 has been appropriated by the Navy Department for installation and repairs to the Alaskan station equipments. It will take at least 100 mechanics to finish the work on time and they will be taken north on the Saturn, which will arrive shortly from Mexican waters.

It is expected that the Saturn will start on the northward trip by April 1, 1917. The sum of \$27,500 has been appropriated for a new equipment at the Cordova station, the old station being allowed to remain in service until the new station is completed. \$22,000 has been appropriated for the St. Paul station, \$7,203 for Sitka, \$5000 for St. George, \$9250 for Kodiak, \$11,000 for Dutch Harbor and \$47,000 for a new station at Seward.

ARE YOU A BOOSTER?

10,000 radio enthusiasts thruout the United States are boosting this magazine. Are you one of them? In order to become a "Full Fledged Booster" it will be necessary for you to send in your subscription at once. Don't lay this magazine aside until you have properly filled out the subscription blank.

HALLER CUNNINGHAM COMPANY CLOSES IMPORTANT MARINE CONTRACTS

The Norwegian steamers "Talbot" and "Thordis" will be equipped with the standard marine type of Haller Cunningham wireless apparatus during the early part of this month. The "Talbot" is a new steel freighter, recently constructed at the Union Iron Works' plant in San Francisco. She displaces 10,000 tons. The "Thordis" is also a steel steamer and is under construction at the Moore & Scott shipyards in Oakland. She will be used to carry freight between this continent and Europe and displaces 8,000 tons. Including these two vessels, the Haller Cunningham system is in use on 25 vessels.

Mr. G. Haller will leave for the east coast this month in order to close a number of important contracts.

WATCH FOR THE MARCH ISSUE

It will contain a complete account of the Haller Cunningham system of wireless telegraphy, illustrated with many photographs of the latest type of panel equipments, receiving sets and other Halcun apparatus. Several striking photographs of ship station installations and photographs of the vessels employing the Halcun system will be one of the special features of the March issue. Mr. Haller's story regarding the advantage of privately owned wireless equipments will be published in the next issue. Subscribe at once in order to insure receipt of your copy.

6000 MILES ON GALENA

During the month of October, Mr. H. C. Seefred of Los Angeles copied the Japanese station at Funabashi, a distance of approximately 6000 miles. The Marconi high power station at Honolulu was copied six inches from the phones.

Electric Condensers For Producing High Frequency Alternating Currents

By Dr. B. N. Burglund

There is no part of the high frequency apparatus that requires as much attention as the condenser, in fact high frequency currents cannot be produced without some form of capacity or condenser.

Our technical libraries are today full of works on the "Oscillatory Discharge" of condensers and how, in connection with a suitable inductance high frequency currents are generated by this discharge.

In order to bring my argument more to the point, and refresh the minds of some of my patient readers, I am going to glance over this phenomena lightly and use the "Water Bottle" experiment for one.

Place two wide mouth bottles side by side on the table; (bottles with outlets in the side near the bottom) obtain some different sizes of rubber tubing, some $\frac{1}{8}$ " x $\frac{1}{4}$ " and some 1" stock.

Cut these in lengths of about 18 inches with suitable reducing plugs, adjust these in the bottom outlets of the two bottles in such a manner that each different size of tubing can be experimented with separately. Have a stop watch ready to check the experiments.

Now by filling one of the bottles half full of water, you will notice the water rise to the same level in the other bottle, this being due to the water flowing thru the connecting tube into the other bottle.

Try this experiment with the different sizes of rubber tubing, and note by the stop watch the time required for the water to reach an even level in both bottles. You will notice that by using the small tube a longer time is required for the water to find its level than with the use of the larger tubes.

Now, with a rapid motion, plunge something into one of the bottles and note the time required to find the water level. With the same rapid motion remove the displacing object and let the water find its level by its own effort. You will notice that the water in the first bottle rises to the neck of that bottle but as soon as the plunger is removed from the other bottle, the water soon begins to seek its level.

The water will not seek its level immediately but only after its height in the bottle has varied up and down a number of times. This water bottle analogy explains or rather illustrates how and why electrical currents are produced in the helix or primary of the high frequency circuits.

For instance, the two bottles represent two Leyden Jars or condensers, the water inside the jars represents the inner coating and the rubber tubes represent the helix or primary connections between the outer coatings of the condensers.

The size of the different tubes represents the resistance of the oscillatory circuit, and the time required to fill the jars thru the rubber tube represents the "Damping" and Oscillation Constant, $\sqrt{C \times L}$. Now in the water bottle case the damping is enormous, due to the high resistance of the small rubber tubes and the comparatively large volume of water that has to pass thru the tubes from one bottle to the other. From an electrical point of view, these bottles should be connected by a tube or circuit whose interior area is equal to the volume of water stored in the bottles when this water is at rest. Now the damping would be very low and the water would alternate very rapidly between the two bottles. This is not exactly what takes place in a piece

of high frequency apparatus and a little more explanation on the water bottle principle is required before this analogy is complete.

The time factor of charge and discharge are so great in high frequency or wireless work that an explanation is necessary in order to simplify my statement. We will take for an example the ordinary wireless telegraph transmitter, say of 1 K. W. capacity, so designed that at 60 cycles it would radiate with its maximum efficiency. Here we have a problem of design that has for its base a 1 K. W. 60 cycle energy to be converted efficiently into electric waves, these waves to be transmitted thru space.

The first problem is to design a condenser to handle 1 K. W. at 60 cycles. Laying theory aside for a moment and examining past results of experimental stations we find that a condenser must not be too large, otherwise the oscillation constant would be too large, and if the condenser is too small we would require too high a potential across the condenser (here again we run up against difficulties) so by experiment we find a condenser of about .009 M.F. capacity and working at a potential of about 30,000 volts to work at the best efficiency for 60 cycle 1 K.W. of energy input.

A radiating circuit including antennae and secondary of oscillation transformer so designed as not to have a greater period than 450 meters will radiate this energy (1 K.W.) at its best efficiency. The wave trains in this instance would take place with a frequency of 120 per second and the potential at the aerial end of the helix should be about 25,000 volts.

The damping of the primary circuit will be large, owing to the long spark gap necessary to use 30,000 volts, this being not a detriment but a help, as it helps to quench the oscillation circuit and lets the radiating circuit go ahead undamped. Here again some

explanation is needed; some authorities claim a voltage of 12,000 to 15,000 is the best, this being proven by actual tests on apparatus in commercial use and other laboratory experiments as well, not to be so.

At 12,000 volts the condenser is necessarily large, consequently a very large natural period which is way beyond the limit, and the current values in the condenser and oscillation circuits rises to an enormous value and are hard to control in the spark gap.

The design of the oscillation transformer, answering to this discharge current value, would be such that the ratio of turns between primary and secondary would be such as to prohibit efficient radiation. A large oscillation constant would mean few turns, if any, in the primary, and an antenna voltage so low that no energy would be radiated unless a large antenna surface is used, and this again would mean a longer wave, which at low voltages will not "carry" efficiently.

By examining statistics of stations that hold the long distance world's records we see that some of our pet theories are at fault and look a little deeper for a satisfactory explanation.

Going back to our condenser experiment we find that a condenser of .009 M.F. is the best value to use with a charging voltage of 30,000 volts. Experience and practical tests show that a helix of two or two and a half turns, 15 inches in diameter spaced about one inch apart with an overall connection of not more than 12 inches, give us the best oscillatory circuit at this condenser value. This again is equivalent to 450 meters; at $2\frac{1}{2}$ turns the maximum number of lines of force are set up within the helix.

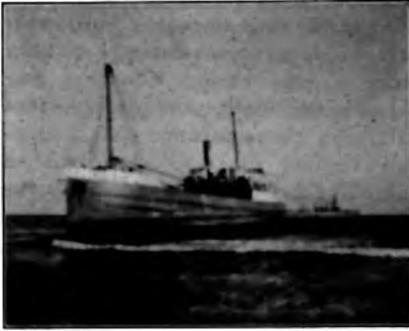
Here is where we come to the very important point, the reason why condensers should be constructed along certain lines. In order that conden-

(Continued on Page 74)

The Wreck of the "Fort Bragg"

By Max W. Haub

[This is an old story, but the full details of the wreck have never been published.—Ed.]



THE "FORT BRAGG" ASHORE
The U.S.S. "San Diego" in the
Background

November 5, 1915.

Log of the Radio Officer.

3:40 a.m.—Struck 25 miles north by east of Cape San Lucas, Lower California. Distress signals were sent out with position following call. Static was terrific with unusual density and quantity of its kind in Mexican waters during rainy season.

4:48 a.m.—Condenser of radio set blew up. Engine room was flooded by this time and all fires were out. We worked set until 7:10 a. m., power being obtained from generator driven by steam engine, steam being supplied from the donkey boiler. Received answer to our call from NCZ. NCZ broadcasts call and after some time decides she would come to us, she being 230 miles away at that time.

(The NCZ is the Cruiser San Diego.)

The first boat lowered at 4 a. m. was capsized by the heavy surf; six men including the first officer were thrown into the water and barely escaped drowning. A line was taken ashore by a German stowaway, and a life line with a breeches buoy was soon rigged up, passengers being sent ashore by this arrangement.

No lives were lost, due to the excellent seamanship of the crew of the "Fort Bragg."

At 10 a. m. the sending set was put out of commission due to a burn out in the transformer.

By means of a blinker-light, operated from storage battery, signals were exchanged with the "San Diego." At 6:30 a. m. on the 6th of November the crew of the "San Diego" came alongside in small boats. The Captain of the "Fort Bragg" boarded the warship and interviewed Admiral Winslow, the whaleboat being struck by a breaker on his return, collided with a rock near by, immediately filled with water and sank.

After much hard labor, the crew succeeded in getting the Captain aboard, while part of the crew resorted to swimming and reached the shore safely.

Two hours after the mishap, the entire crew of the "Fort Bragg" were safe on board the warship, which then sailed for San Diego.

The passengers suffered the usual excitement of embarking and disembarking in small boats on the high seas, one woman, being overcome by a nervous shock, had to be treated by the doctor aboard the "San Diego" and was later sent to a hospital upon arrival.

On the morning of November 8th, we arrived safe and well at San Diego.

RAVINGS OF A NAVY RADIO ELECTRICIAN

In the city of Ukiah,*
Where the Navy Dips all go,
There is an inner circle,
They are seated in a row.
And when a new one makes his bow,
And says, "I've come to stay",
The rest of them set up a howl
And hollar QRA?

Chorus

Oh QRN and QRM, QRY and say,
QSO? A few steam beers,
We all are here for thirty years
QSA, so K.

The keeper saunters slowly in
And then they QRT
Unless they whisper,
Then QRL, also QSZ
But the keeper is a watchful bird
Tho they QRP;
If they cannot hit the ball
Then they "PRB".

Chorus

Oh, QRN and QRM and QST to boot,
QSR? to the folks at home;
Quote: "Their son is empty in the
Dome"
QRK, so shoot.

"I'm all right, the world is wrong".
The new ones always yell;
QRW with my stick,
QTA and QRL.
The check is off, done chew the rag,
Will QSU at three.
Conversation is not allowed,
Anyway, QRZ.

Chorus

Oh, QRM and QRN, POM except,
The static filter is on the bum.
Twat, Twat, Tweet and Dum, Dum,
Dum,
Where is the "Hypo" kept?
*The "Funny House" is located in
Ukiah.

ANOTHER FEDERAL RECORD

The Oceanic liner "Ventura," equipped with Federal Telegraph apparatus, succeeded in copying signals from OUI, the German station, for the entire voyage from San Francisco to Sydney, Australia.

TWO MORE CONTRACTS FOR HALLER-CUNNING- HAM COMPANY

The American passenger steamer "Itona" will be equipped with Halcun apparatus in Los Angeles harbor on January 10th. She was formerly a private yacht and will be placed on the Mexican run within the course of two weeks. The Norwegian oil tanker "Malmanger" is being equipped with Halcun apparatus on the east coast.

A distance of 2700 miles was covered with Halcun apparatus installed on the American steamer "Costa Rica" on her north-bound voyage from the Mexican coast.

OPERATING DIFFICULTIES

American Operator to Englishman who has just arrived: "What are your call letters?"

Englishman: "M-zed-a"

American: "M-zed-A?"

Englishman: "Aye"

American: "M-zed-I?"

Englishman: "No—M-zed-A"

American: "A?"

Englishman: "Aye"

American: "I?"

Englishman: "No—A"

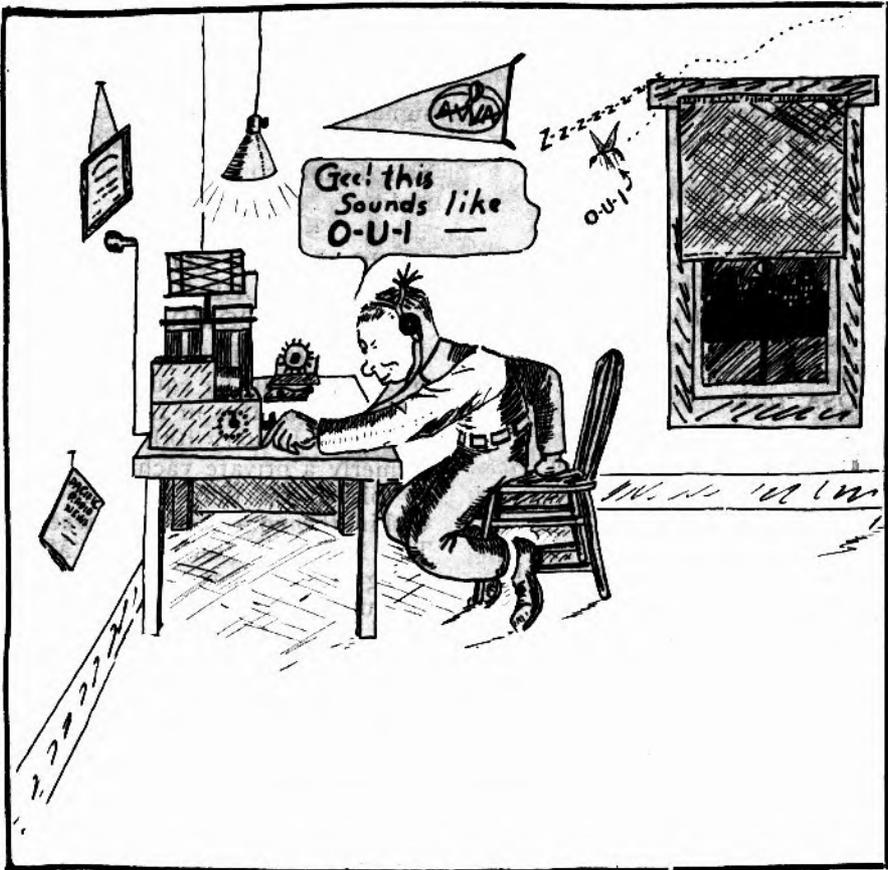
American: "A?"

Englishman: "Aye"

American: "I?"

Just then the condenser punctured and they never did get it straightened out.—J. W. B. F.

Heard Above 200 Meters



LONG DISTANCE RECEIVING ON A "PARTNERSHIP AERIAL"

A new aerial system has been inaugurated, entitled the "Partnership" aerial. Strange as the title may seem, the results obtained from the aerial are equally surprising. We have all heard of the umbrella, flat top, directive, "T", "L", straight-away, and other types of aeriels, but who has heard of the latest in aeriels? The "Partnership" aerial was introduced by a San Francisco amateur, it was not an invention but a mere discovery. It was given a practical test but failed to come up to the required standard of a modern aerial, due to its directive effect which was very noticeable.

Out near the great, green ocean on the shores of the Pacific, there lies a peaceful amateur station, the name of the owner being withheld by the censor for military reasons that may prove to be of some value to the enemy. The aerial that we have under consideration is an ordinary one wire receiving aerial, approximately 200 feet long, suspended from the roof of a house in which the new inventor spends the happy hours of his life.

On a cold Saturday night the owner of the new aerial gave it a practical test and to his surprise the northern stations could be heard with remarkable audibility, but eastern stations could not be heard at all. On Sunday night the northern stations could not be heard but eastern stations came in loud and clear. The inventor was mystified and lost many hours of sleep over the mysterious effect of his new aerial. The next morning, however, the entire mystery was solved; the young inventor noticed that another enthusiast had tapped his aerial at the other end, thus making it a practical "Partnership" aerial. The innocent "aerial tapper", as we shall call him, thus saved the expense of constructing a separate aerial, but his pleasure was short lived, he was instructed to remove the lead and received further instructions to the effect that any more aerial tapping would lead to disastrous results.

Thus ended the "Partnership" aerial tragedy.

Life Of a Warship Operator

"HAVE A HEART."

*A sailor sat in a radio shack
With a red hot ventilator scorching his back.
His legs entwine a rotary gap,
As the sweat runs down his care-worn map.*

*A steam turbine was under his chair,
A noisy fan belched a stream of hot air.
Of course I know that you don't care,
But between you and I, it's 'ell for fair.*

*The roaring blaze in the firerooms below
Heats up the steel, so much so—
That he suspends calloused feet in mid-air
And watches the varnish peel off the chair.*

*He sits this way six hours out of eighteen
With a pair of fones clamped tight to his bean,
Struggling with problems ne'er heard of before
To get you the latest dope on the war.*

*In the wee small hours of each dreary night
While his shipmates lie poundin' their ear till daylight
And dreaming of home, mother, sweetheart and all,
We're right on the job and hitting the ball.*

*Getting the dope so you'll have it at day,
Fighting a weak spark that's fast fading away.
Great God Almighty, how slow the time flies,
Struggling and straining against tired eyes.*

*Not a single fresh breath, not one soothing breeze,
While he annihilates cockroaches and fleas.
Night reigns forever and your eyes drop and fall
But all the time you keep pounding the ball.*

*And then it is over, the sun comes at last,
We sit down and swallow our humble repast.
Then take a few minutes' sleep on deck,
While a big husky sailor walks over your neck.*

*"Snap out of it, you," a voice will cry,
"If I was like you I'd go off and die;
Get off that paintwork, don't lean on that rail,
Boneheads like you should be locked up in jail."*

*"Get up while I sweep this deck, I say,
For the love of Mike don't stay there all day.
Don't see what they ever let you ship for,
Come on, fellers, let's read the dope on the war!"*

HANDY HINTS

ANTENNA CONSTRUCTION

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.]

A very noticeable error made in the construction of the average amateur antenna is the lack of care and judgment used in the insulation and general electrical design. One does not, of course, expect an amateur's antenna to be erected with the same skill and care that is exhibited when an antenna is erected by men who have had considerable experience in general electrical and radio fields; however, it seems that any amateur who even contemplates the erection of an antenna should use his common sense and judgment in the work.

As a rule, the two greatest faults noticeable in amateur construction are lack of proper insulation, and the use of wire having a high resistance for the oscillatory currents.

When erecting an antenna most amateurs, when the question of insulation arises, simply figure vaguely on the use of "cleats", the matter being temporarily dismissed until the actual erection is in progress. The cleats are inserted in a haphazard fashion with a hope that they are in the right place, for when an aerial is in the course of construction everybody is usually excited to such an extent that no time can be spent in thinking over the points where leakage is most likely to take place. As a result the insulators are inserted so as to insulate each aerial wire from the spreader instead of insulating the spreader from the mast. The wires are attached to the insulators, the connections soldered and the aerial is hauled up.

All goes well and good for a time, but the radiation reading on the aerial ammeter gradually decreases, and friends complain that the spark comes in weak; more power is used and still the spark does not come in as loud as it formerly did. Finally, after many experiments and tests are made, the operator decides that there is a "jinks" wished on his station, and gradually his interest wanes.

Had the operator used good judgment in placing the insulators in the aerial, none of the above named troubles would have been experienced. In the first place, the use of cleats for antenna insulations is a rather doubtful procedure. Cleats are, no doubt, fairly well suited for the insulation of receiving aerials, but their use on transmitting aerials should be avoided whenever possible. Few cleats are glazed, and even those which have been glazed are never finished on the under side. As a result the pores of the porcelain are soon filled with dampness, and a great reduction in the insulation resistance is noted. The cleats could be covered with vaseline, but this is only an excuse. For all-around work good rubber or electrose rod insulators should be used. The writer prefers to use hard rubber rods, with a diameter of about one inch, having a length of a foot or more. Rings, which should be of brass, can be fastened to these rods by drilling a small hole in either end of the rod, and then inserting the end of the rod into boiling water.

When the rod is sufficiently softened, which will take about ten minutes, brass screw eyes can be screwed into the ends of the rods, and when the rod cools the brass screw eyes will be firmly held by contraction of the rubber. In the second place, the insulators should never be placed on each aerial wire, they should be placed in the rattail or bridle portion of the antenna. The reason for this is simple; for example, if the resistance of a single insulator is, say fifty meg-ohms*, the resistance of two in series is, of course, one hundred meg-ohms. Now if we place these two insulators in parallel the resistance drops to 25 meg-ohms; if four are placed in parallel the resistance drops to $12\frac{1}{2}$ meg-ohms, etc. Thus it is easily seen that when insulators are placed in parallel, as they are when an insulator is placed at the end of each wire, the real insulation resistance is much lower than it would seem to be when the resistance of a single insulator is taken into account. If the same number of insulators are used, but are placed in series in the bridle of the antenna a much greater insulation resistance is obtained, without any increase in the cost of insulating material, and a higher efficiency is obtained.

As a general rule most amateur antennas are erected with small wire, usually number twelve or fourteen for the conductors. For a small equipment, using a spark coil, this no doubt suffices, however, for an antenna from which any power is to be radiated a much larger conductor should be used. This conductor should be of no smaller size than number seven or eight, B & S, or better still, a stranded conductor should be used. As is well known, the high frequency currents travel on the surface of a conductor and the smaller sizes of wire offer very little surface

for the flow of this current, but when larger wires are resorted to, there is plenty of surface for this effect to take place. When stranded wire is used a given weight of metal will mean a great increase in surface and for this reason stranded wire is the best and cheapest in the long run. If it can be procured, the stranded wire should by all means be used.

The aerial leads are of as great importance as any other part of the aerial. The leads brought down from the aerial should be of such size that their combined current carrying capacity is approximately the sum of the capacities of each strand of antenna wire.

The insulation of the lead-in scarcely needs mention; it will be sufficient to say that it should be perfect. If it can be obtained, a large thick wall-ed rubber or porcelain tube should be used, or what is better still, a large electrose lead-in insulator. In place of the above, a good make-shift can be made of a long piece of thick wall-ed glass tubing—a piece of broken gauge glass tubing, which can be had for the asking at almost any factory where a steam boiler is operated, or in place of this a long piece of common glass tubing will give satisfactory results.

If amateurs will take note of some of the hints herein mentioned, and apply them in the construction of their antennas an increase in the operating efficiency of the apparatus will be the result.

ALL NEWS DEALERS IN THE UNITED STATES SHOULD HANDLE THIS MAGAZINE

If your news dealer is unable to supply you with copies, kindly send us his name and address in order that we may furnish him with the required number of copies.

*One meg-ohm equals one million ohms.

DO YOU KNOW

- THAT** when the radio station was first opened at the Farallon Islands, vessels were governed by an order stating that if they wished to communicate with the station they must have to do so within a radius of one mile of the station. The signal for communication was five blasts on the steam whistle in order to attract the attention of the operator in charge, who might be busy fishing or painting the roof?
- THAT** the stations of the old Pacific Wireless Telegraph Company, located on the Merchants Exchange Building in San Francisco and another on the Goldberg-Bowen Building in Oakland, were equipped with 2 K. W. straightaway sets and a microphone detector, and it was an absolute impossibility to establish communication between the two stations, a distance of 10 miles?
- THAT** the services of four messengers were necessitated, traveling back and forth between San Francisco and Oakland by ferry in order to deliver the supposed radiograms that were filed at the two stations mentioned above?
- THAT** the U. S. Revenue Cutter "Rush" was the first vessel equipped with radio apparatus on the Pacific Coast and was stationed at Seattle, its equipment comprising the Pacific Wireless apparatus?
- THAT** Lawrence Malarin was the first operator on the Matson liner "Hilonian" and that the Radio set was continuously out of commission for the entire round trip, due to sea-sickness of the operator?
- THAT** The total capacity of a ship aerial is usually less than one standard leyden jar?
- THAT** aeriels give greater relative capacity for a given amount of wire; but the effective height of the aerial is decreased and they are subject to high potentials at both ends?
- THAT** when an increase of air pressure is applied to a compressed air condenser the dielectric strength of the air increases?
- THAT** the dielectric strength of mica is as great as 5000 volts per mil?
- THAT** a piece of graphite, such as the point of a hard drawing pencil, makes a very good contact point for a galena detector?
- THAT** the speed of a series wound motor can be controlled best by putting a resistance directly across the armature, and that this does not lower the starting torque of the motor?
- THAT** the so-called "Hudson" filament of the DeForest audion is composed of both tungsten and tantalum, the reason being that the tungsten withstands heat best, while the electron emission takes place from the tantalum?
- THAT** the height of an antenna has a direct relation to its radiation resistance?

The Midnight Wireless Call

By Ray Diamond



Beautiful word, Tonight! Transformed
From calm of Peace to demon of Storm.
Snuffing the lights—mere candles of Man,
From shore and rock with Supreme hand,
Mountains high, the combers seem,
Tossing frail craft with groaning beam;
Wrenching weak joints—loose plates find,
Element of vengeance with Master mind.

On Cape Mendocino's rugged shore
The breakers pound as ne'er before;
Out in the gloom the pitch black night,
Through hail, wind and sleet, a losing
flight
Fought by the ship on the billow's crest,
The groan of her keel—a prayer of rest
Spoke of defeat in this hour of night
As the storm shut out Mendocino's light.

Could puny Man cope with this fight?
Ah! Out of the depths of treacherous
night
A spark! A wave—a vibrating note,
A call for help no storm could smote;
A clear, steady and high pitched tone
Vibrated the diaphragm of many a phone,
Clasped to ears—the face now grave—
Grasping each word—lives to save.

The tone of that spark as a human spoke
With cry of command and then it broke—
To come back again with despair and
appeal
The auxiliary flash thru the night did
steal,
Pleading for help with mournful cry,
Asking assistance from those near by;
To aid in the rescue of woman and child,
Man and his mate from the Tempest wild.

The scream of the tempestuous violent
squall
Could not obliterate that wireless call;
Out of the depths of murky night,
A response—"Have courage," brought the
light
To many a soul thought lost in the dark,
A sigh of relief brought the wireless
spark,
As the crews of the sturdy manned the
deck,
A change in their course to yonder wreck.

Braving the storm, they know no fear,
The voice of the sparks now disappear;
For great breakers lashed with fiendish
glee
The man of the spark out in the sea.
A feeble light, a ray of hope,
A hurling line and another boat;
Life upon life the rescuers saved,
Saved from the depths of a watery grave.

No guiding light to be seen afar,
Left to her doom on Humboldt Bar;
In peaceful days the sun to belch,
Her ribs, remains, on a sandy beach
There to remain—a heart once brave,
Who stood by his key—many lives to save,
As for himself—his soul! 'Tis well,
His last note sounded, Good-Bye,
"Farewell."

RAY DIAMOND
18

Pacific Radio News

The First and Only Wireless
Magazine Published on
the Pacific Coast

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

Subscription Price:
For U. S. and Mexico \$1.00 per year,
payable in advance

Foreign Countries, \$1.50 in Gold

Out of town checks not accepted
unless necessary exchange is added.

Single Copies, 10 Cents

Forms close first of month pre-
ceding date of publication.

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 FEBRUARY, 1917 No. 2

EDITORIAL

Have our two first issues come up to your expectations? Have we published the news that every Radio Operator can read with interest? Is our magazine just a little better than the other existing radio publications; or have we fallen below the required standard of a first class wireless magazine?

It is up to you, Mr. Reader, to answer these questions and show us the good and bad points of this publication. We need the opinion of every reader on this subject in order that a larger and better magazine may be at your disposal. As far as we are concerned, we feel satisfied that we have done everything possible to give you a magazine that fills the above named requirements.

The opinion of the reader and the publisher will vary within wide limits, and for this reason we desire to have you comment on this issue; show us the good and bad points, tell us what you want and how you want it and we will do everything possible within reasonable limits to raise the standard of the magazine. If the magazine contains too much local news, if the articles do not prove to be of general interest to you, please do not hesitate to send in your suggestions, each suggestion will be considered separately and we feel satisfied that a successful compromise will be attained.

We have some excellent articles in store for you but we will not publish them until our subscription list assumes larger proportions and for this reason we ask you again to send us your subscription at once.

We will raise the price of our magazine to 15 cents per copy within a very short time. This action was made necessary by the ever-rising cost of paper, printing, and other material used in the publishing of the magazine.

We are going to give you a fair chance to take advantage of the \$1.00 subscription rate but you must act at once, don't wait until tomorrow, the advanced rates may be announced at any time. Get your friend to subscribe, tell him about the increased price of the magazine, send us his name and address and we will do the rest.

You may be under the impression that the size of the magazine will not warrant an increase of

price, but that is the incorrect stand to take, don't worry about the size of the magazine, it's the quality of the articles that count.

With an increase of price, the size of the magazine will also increase and the quality of the articles will increase in like proportion. How many publications have maintained their standard by an increase in size? As a general rule the usual standard drops to a surprising degree and seldom resumes its normal standard.

If we were not positive that better articles could be published after the increase takes effect, we would not dare to raise the price.

COMMENT ON THE RADIO ACT

We have been requested to state our opinion on the new proposed Radio Act that was published in the initial issue of this magazine. Before doing so, however, we wish to state that our reason for publishing the law in full, was to give you the entire information from A to Z, regardless of the length of this interesting document.

Our statement illustrated on another page of this issue clearly shows our opinion on all radio questions, we are neutral, so to speak, as regards the undertakings of the numerous radio corporations. The proposed Act as it stands at the present time, will undoubtedly have to be altered in some respects, as certain clauses are open to criticism and have caused no little uneasiness among the officials of the leading wireless corporations. The "Alien" clause is one that will set every true American thinking, it should be considered thoroughly by every reader of this publication as

it will have a great effect on the future developments of the wireless field. Heretofore no one has been barred from securing an operator's license to operate commercial stations, and an endless amount of comment has been made by many radio men in this country regarding this action.

If an American ship or land station is equipped with American manufactured apparatus, is controlled by an American corporation whose stock is controlled by American interests, we feel justified in stating that an American operator should be placed in charge of the apparatus. If you happen to meet a well versed radio operator and ask him concerning the operating qualities of operators of various nationalities, he will undoubtedly tell you that the American operator cannot be excelled. The American is the best all around man to be placed in charge of a radio set, you can send him to any part of the world and he will show them all that an American operator cannot be beaten. The touch of the key, the manner in handling the traffic, and other distinctive characteristics go far to make him the most proficient operator in the world.

We are only considering this question from an American's point of view and we are working to the interest of our country; for this reason we are also in favor of the clause regarding the control of capital stock as described in the January issue of our magazine.

The columns of this publication are open to comment on the question of the new proposed Act, and we desire to have the opinion of various radio men on this subject.

ELECTRIC CONDENSERS FOR PRODUCING HIGH FREQUENCY ALTERNATING CURRENTS

(Continued from Page 63)

sers will stand the required voltage without rupture or overdue heating, they should be constructed so as to eliminate brush discharge losses completely. The electrostatic constant of the dielectric should be very high; the electric conducting coatings should have an ohmic resistance as low as possible, very nearly zero because when we stop to consider the time factor of our oscillations and in the limited time required for each complete discharge or oscillation, then only do we realize the necessity of extremely large conductors.

Let us roughly estimate what really takes place in an oscillating circuit, say of 450 meters, the condenser being charged at 60 cycles or 120 times per second. Our condenser is so constructed that it will take 1/120th part of a second to charge it, by this time it has accumulated 1 K.W. of energy. At 450 meters this oscillation constant will be in the neighborhood of one half millionth part of a second, in which this complete amount of energy must be discharged and re-charged again in the opposite direction. Our initial voltage is only 30,000 and the time is one-half millionth of a second, that means that the energy must be discharged 41,666 times as fast as it is stored, or 1 K.W. in this short space of time represents 1,250 amperes at 30,000 volts or 1/5,000,000 part of a second. In order to handle this large amount of energy in so short a time as 1/5,000,000 part of a second, it is necessary to construct all parts of the apparatus in such a manner that no losses occur due to resistance, especially in all parts of the oscillating circuits, including condenser connections and spark gap leads in designing transmitting apparatus, if the above

mentioned principles are borne in mind, a better and more efficient instrument will be the result.

Amateur 6ZEP: "KPH worked Germany this morning."

Amateur 6BUL: "Like Kelley did."

WHAT THE NEXT ISSUE WILL CONTAIN

A complete description of the latest type of Halcun apparatus.

An interesting story of the Farallone Islands station.

A fine fiction story by Mr. E. Walden.

A good "MAKE IT YOURSELF" department and numerous articles that have never before appeared in print.

RELAY TIME CHANGED

The relay test message sent from the Seefred Station (6EA) in Los Angeles will hereafter be sent at 8:15 p. m. on Thursday and Sunday evenings. Members of the American Radio Relay League are requested to be on duty at the specified time in order to establish communication as far north as possible. This applies to all station operators on Trunk Line "F".

HAVE YOU EVER STOPPED TO THINK

Of the thousands of wireless enthusiasts whose hearts were filled with joy when they heard that a Pacific Coast magazine has come to stay? We need your support and your subscription; subscribe today.

ARE YOU A SUBSCRIBER?

If not, don't forget to make use of the subscription blank in this issue. Beat the high cost of living by sending in your subscription at the dollar rate before the advanced price takes effect.

RADIO ORGANIZATIONS

TWO PAPERS READ BEFORE THE INSTITUTE OF RADIO ENGINEERS

The second meeting of the San Francisco Section of the Institute of Radio Engineers was held on December 19th, in the Engineers' Club room on the 9th floor of the Mechanics Institute Building in San Francisco. Mr. W. W. Hanscom presided over an attendance of forty-nine members, one-fifth of which was composed of members of the San Francisco Radio Club.

The supper, which was held before the meeting, was attended by twenty members and proved to be a great success.

A paper was presented by Mr. O. C. Roos, formerly an engineer in the service of the Insular Government of the Philippine Islands; the lecture being illustrated with lantern slides showing the graphical locations of the numerous stations scattered throughout the Philippines. He described in detail the systems used, and the means employed in handling traffic between the stations. He also compared the general operating efficiency of the radio system to that obtained with the cable system of communication that was formerly employed. The lecture was followed by a general discussion on the subject.

Mr. E. W. Stone, Assistant U. S. Radio Inspector, presented a paper giving the results obtained with various types of impulse excitation transmitters. He also traced the history of the impact excitation transmitter from its discovery by Sir Oliver Lodge, in 1897, to date. Several interesting points were brought up in

the discussion which followed the reading of this paper.

The meeting was adjourned at 10:40 p. m.

MEMBERSHIP OF S. F. RADIO CLUB RISES TO 76

San Francisco's only radio club now has a membership of 76, the prospects of increasing this number to 100 within a very short time is not at all impossible.

A membership campaign was inaugurated several weeks ago with the object of increasing the membership to 100 by the termination of the year. Five new members were admitted to the club on December 15th, and the applications of ten prospectives will be considered at the next business meeting.

The initiation fee for members and associates was increased from \$1.00 to \$2.50, taking effect on January 1st, 1917, the monthly dues remaining the same. The member who succeeds in obtaining the largest number of new members at the close of the contest will be exempt from payment of six months' dues, the person ranking second will be exempt from payment of three months' dues.

The Christmas Radio Raffle, held on December 23rd, proved to be a success, many valuable radio articles were raffled, the proceeds being used for extensive alterations to the club room. Among the articles raffled were audion bulbs, subscriptions to the "Pacific Radio News," keys, telephone receivers, switches and various other articles.

Two business meetings are now held monthly instead of three as was

formerly the case. One formal and one informal social meeting are also held monthly, the business and social meetings following each other in alternate order.

A general radio call is being transmitted nightly by club members in San Francisco and the Bay districts. The membership contest has been announced via wireless and results were noted to a marked degree.

Mr. L. E. Jeffrey, of Berkeley, Cal., is sending the message several times nightly while Mr. W. M. Griffith and Mr. H. C. Brown are sending the message in San Francisco. Mr. Jeffrey's QST has been heard as far south as Los Angeles.

CARNEGIE INSTITUTE TO ESTABLISH CHAIN OF COLLEGE STATIONS

Under the direction of Prof. A. Van Dyck of the Carnegie Institute, a movement has been instituted to join all technical school and college stations in the country together, by the establishing of definite working hours and schedules. The idea being that much better and worth-while results can be obtained from the college apparatus, as well as tending to promote a feeling of goodfellowship, through the mutual exchange of news items.

Persons interested can obtain further information by addressing Prof. A. Van Dyck, Carnegie Institute of Technology, Schenly Park, Pittsburg, Pa.

IF YOU KNEW

How many good articles we have for publication in future issues, you would not fail to subscribe to this magazine.

NOT RATS, BUT STATIC

There once was a man quite erratic,
They thought he had rats in his
"attic."

Poor ignorant boob and helpless rube,
It was not rats he had—it was static.

PRECAUTIONS

Steam heat should never be used to heat the filament of an ultratradion bulb.

Never leave a wet sponge or quantity of liquid near an undamped wave transmitter, this will dampen your wave.

A HINT TO ALL EXPERIMENTERS

Never leave the Ohmsifter uncovered.

Always keep the brushes of a Frequency Regulator set midway between the pole pieces.

Great precaution should be exercised when removing the diaphragms of your fones to prevent the ohms from falling out.

SOME BANKS PAY BIG INTEREST

On deposits, but some banks have ailed. The "Pacific Radio News" is here to stay, it will never fail. It's just as safe to send us your dollar as it is to deposit it in a bank. Subscribe today.



SEND US YOUR NEWS DEALER'S NAME

We will make arrangements to supply him with copies of this magazine if he does not handle them at the present time.

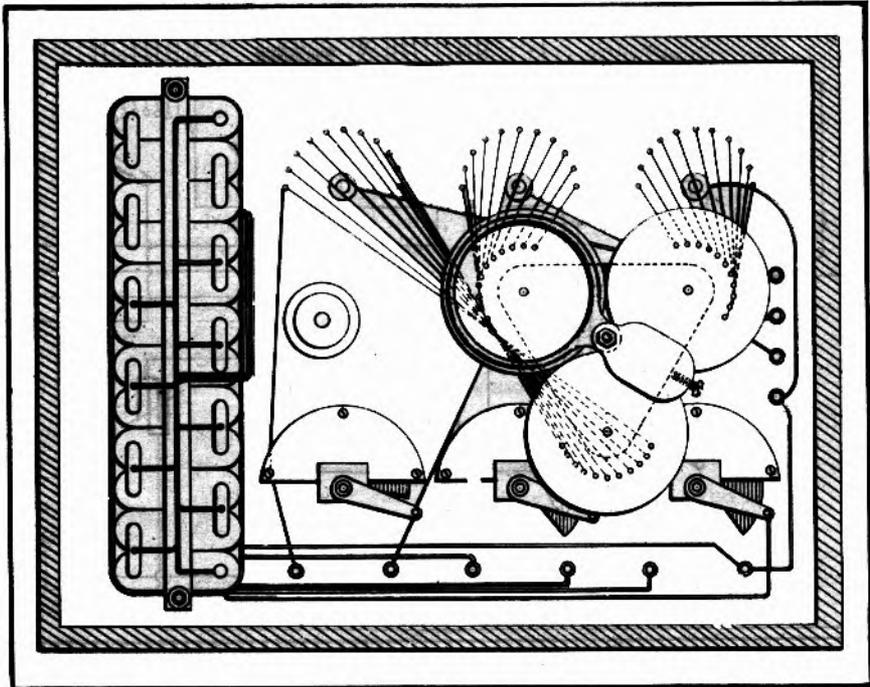
Recent Development of Radio Apparatus

MIGNON UNDAMPED WAVE SYSTEM

Disc Core Type

The object of the above invention was to eliminate all unnecessary apparatus, such as loading-coils and loose couplers, and above all, the distortion of the

and supported in grooves cut into insulated discs, containing the same amount of wire and sections. These three ring coils are then soldered and mounted on the



magnetic fields in the tuner by the operator's hand or body.

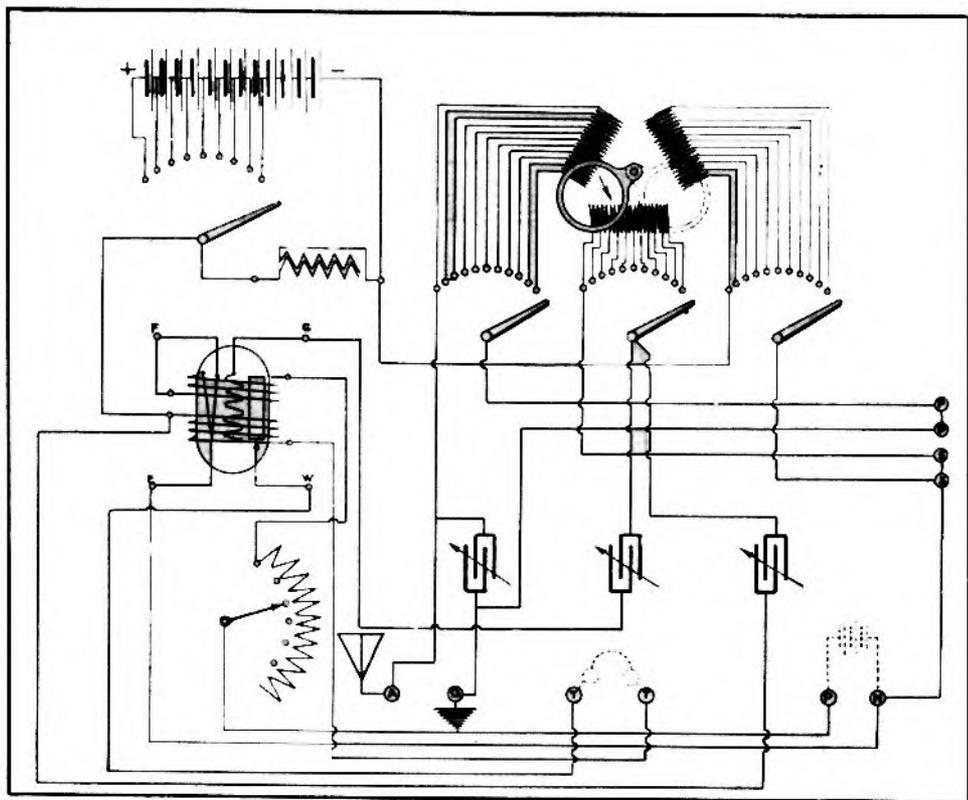
The first step was to build an inductive tuner, consisting of three distinct windings or coils, namely, primary and two intercircuited secondaries, all three being identically the same, ring-shaped

same plane in clover shape instead of facing each other, as in all other systems, and is accurately illustrated in the accompanying diagrams. The magnetic fields of inductances of all three coils are interlinked with each other through the center of each and

may be pictured as inductance rings, or as called hereafter by the inventor, fields of distortion, and which for the first time since the history of wireless signalling has been used to advantage and proves to be of the greatest importance for future development in Radio Telegraphy and Telephony.

pared with other types of tuners.

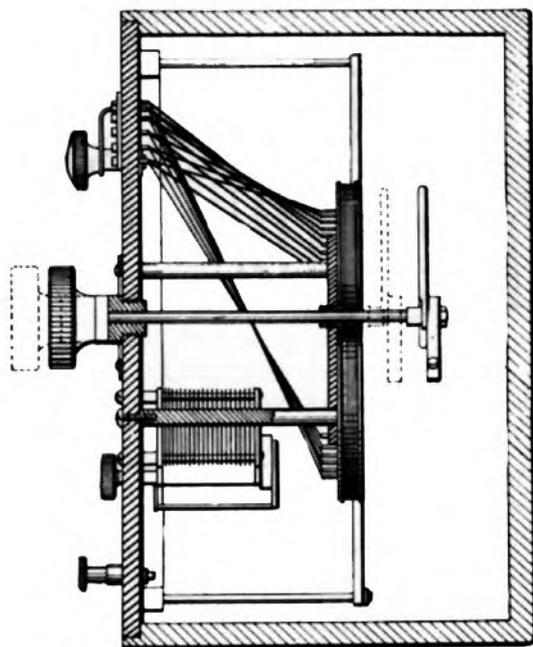
One of the features of this invention is the Metal Disc or Ring core, which is also called by the writer, a "Distorter", and which is so installed as to permit all required position adjustments by sliding and rotation. (See cut.) The object of the Distorter or Core is to control the fields of dis-



The fields of distortion are identically of the same dimensions as that of the actual coils and facilitates an increase of approximately 100 per cent in wavelength capacity, or in other words, it requires only one-half as much wire to build a tuner for a certain wavelength of the Mignon type as com-

tortion and facilitates a decrease or increase in wavelength without the cutting in or out of coils or condensers making it possible to intensify signals to more than 65 per cent of their ordinary strength.

The "Auto Transformer" encircling the bulb consists of a fibre

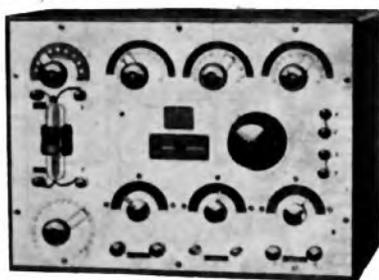


tube $1\frac{3}{8}$ inches in diameter and $1\frac{3}{8}$ inches in length. The windings are of No. 22 B & S double silk covered magnet wire with 14 turns of wire to each coil. This transformer is of remarkable importance to our undamped wave apparatus since its magnetic field oscillations are absolutely in synchronism and consequently stimulate the periodical electron discharge from the filament and the ionization of the gas within the bulb by heat of the filament. The auto transformer increases considerably the audibility of any bulb detector apparatus and effects the immediate oscillation necessary in any undamped wave receptor.

One remarkable fact is that only one size wire is employed in this system, being the same on both primary and secondary.

It has been positively ascertained by extensive experimenting in the up-to-the-minute Mignon radio laboratory that the smaller or finer the wire the more efficient the apparatus.

Another important feature of this system is that the well known detrimental effects in other systems by close range of the different circuit inductances, are entirely eliminated and the effect of the operator's body, when near the apparatus, has no effect on the incoming signals.

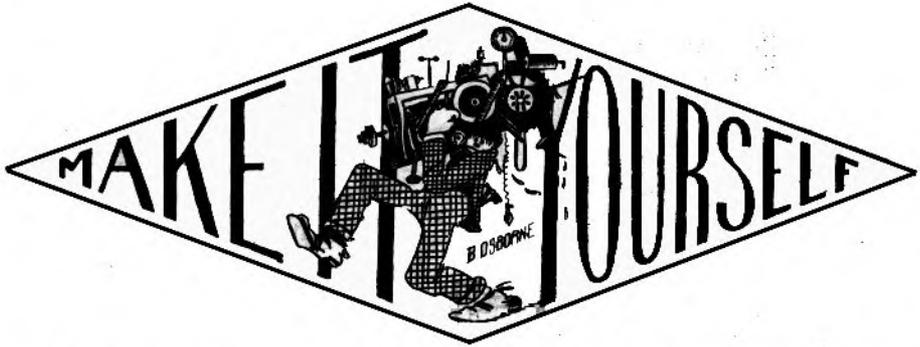


With the use of an aerial sixty feet in length and thirty feet in height and with a lead-in of five feet signals of 9,000 miles distance have been recorded, which were not weak by any means.

A better distance record is being looked for.

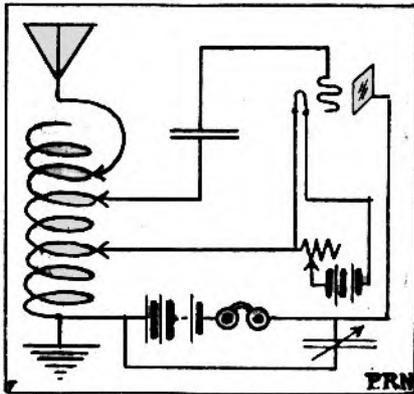
DOES YOUR NEWS DEALER HANDLE THIS MAGAZINE?

If he does not, please inform us at once. Tell him that the S. F. News Agency will furnish him with the required number of copies.



A NOVEL AUDION HOOK UP

The hook up shown below clearly illustrates the very latest type of audion connection. It was perfected by one of the large electrical manufacturing corporations and has never been released for publication.



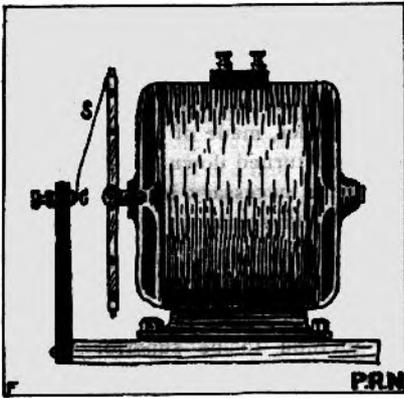
As will be seen from the diagram, a three slide tuner is employed and the hook up will give equally satisfactory results when a loose coupler is used. In this case it will be necessary to use a loose coupler whose secondary winding is tapped at both ends. With the use of this connection, very strong oscillations will be the result; it combines all the good qualities of both the Armstrong and Austin circuits without any of the bad ones.

INCREASING THE EFFICIENCY OF THE ROTARY SPARK DISCHARGER

It seems that most amateurs install rotary spark gaps just in order that they may have the pleasure of hearing a nice musical toned spark or to conform with the idea that a transmitter without a rotary gap will not comply with the law. At any rate, most amateurs maintain rotary spark gaps that are even less efficient than a straight gap.

There are two important advantages in the use of a rotating spark gap. The one advantage is that the musical note or pitch produced by this type of gap more easily affects the ear of the receiving operator. This note, however, has certain limits wherein it is the most efficient in the transmitting circuit. The most satisfactory method of determining the best speed at which to operate a rotary gap is to let an operator at a distant receiving station listen in and judge at what pitch or speed the spark is heard loudest and clearest. An important point affecting the purity of the tone produced by a rotating spark gap is the spacing of the electrodes. In order to produce a musically perfect and clear tone the electrodes of the gap must be accurately spaced. Many amateurs wonder why it is that their rotary gaps do not give a pure and clear note or a note entirely free from

a scraggly or rasping sound. The fault undoubtedly lies in the inaccurate spacing of the electrodes. If, for example, on an eight plug rotary seven plugs are spaced exactly one inch apart and the eighth plug is fifteen sixteenths of an inch from the next the resultant tone of the gap would not be pure; beats would be heard equal in frequency to the number of revolutions of the gap. In most rotary gaps inaccuracies even greater than that cited in the example are found. The result is that these gaps give only an approximately pure musical tone. If amateurs would be more careful in the construction of their gaps and space the electrodes on the periphery of the rotary disc more accurately so that each electrode is equally distant from the next, much more satisfaction would be derived in the operation of the transmitter.



The second advantage of a properly constructed rotary gap is the quenching effect produced by the electrodes being first so close together that the gap is an almost perfect conductor and second being separated so as to be a perfect insulator to the oscillatory current. The common means used to cause the ordinary types of rotary gap to be an almost perfect conductor when the electrodes are opposite are to close the stationary electrodes in until they almost but

not quite touch the moving ones. This is not the most efficient means of producing the desired effect. It seems that designers of rotary gaps fear to break away from established and commonly used ideas and no advance in the construction and design of this type of gap has taken place for years. A radical change in construction or an easy method of changing the usual construction of a rotating gap, an idea which increases the efficiency of it, is to connect the stationary electrodes together and use this for one side of the spark gap and take a connection from the ring upon which the moving studs are mounted for the other side of the gap. Of course, a brush rubbing on the ring itself, like the collector ring on an alternator, would not be the best idea since, if the motor was not very powerful, it would slow the gap down considerably. The method illustrated in the drawing is undoubtedly the best idea to accomplish the end in view. This reduces friction to a minimum and is noiseless in operation. A brass spring S is soldered (or fitted with machine screws) to the ring on the periphery of the rotary disc and is bent so that the point marked C will lie in a line drawn thru the center of the motor shaft. Of course the spring must be far enough away from the end of the motor shaft so that a spark will not jump from one to the other. The contact at C is made by fastening a steel or brass point on the end of the spring and allowing the pressure of the spring to press the point out into a hole drilled in the end of the binding post which is to form one connection for the spark gap. It is necessary that the point and the hole in which it runs be centered in line with the motor shaft.

It will be seen that the oscillatory current runs from the auxiliary binding post direct to the moving studs and thence, across either or both of

the gaps, to the stationary electrodes, the advantage being that the current has two gaps in parallel to jump as against two gaps in series in the old type. The quenching in a rotary disc discharger changed to operate with the two gaps in parallel, as above described, is much higher than in any other similar form of gap and the efficiency of the transmitting set is greatly increased thereby.

THE IMPORTANCE OF A GOOD ROTARY GAP FOR LONG DISTANCE TRANSMITTING

By Hall Berringer

After two years of experimenting to get the best results on a 200 meter wavelength, I find that the rotary spark gap plays a very important part and it is surprising how many experimenters overlook this very important piece of apparatus. Before describing my spark gap I wish to describe the aerial and apparatus used at my station in Burlingame with which I have no trouble to work amateur stations in Phoenix, Arizona, Los Angeles, Cal., and Reno, Nevada.

For an antenna I use four wires spaced on an eleven foot spreader, the wires being 50 feet long, and a lead is composed of two wires of the same length as the aerial proper. This antenna is supported by a mast 80 feet high, and comes down to the point of the roof, under which the transmitting set is located, this end being 12 feet high.

The ground is composed of 30 square feet of No. 12 copper wire, built in the form of a net, this we will call ground No. 1. Then I buried three old water boilers five feet under the surface of the ground, placed directly under the antenna, this we will call ground No. 2. For ground No. 3 I use a piece of copper cable $\frac{1}{2}$ inch in diameter and thirty feet long which is connected to the water mains. The copper net in ground

No. 1 is buried one foot beneath the surface.

I have experimented with all makes and types of transformers, until at last I decided to build one myself. It is of the closed core type, the core alone weighing 150 pounds. The secondary was constructed to supply between 60,000 to 75,000 volts. With this enormous voltage, and using three condenser plates with tinfoil coating 12x12 inches and the rotary gap that I am about to describe, I have obtained results that are certainly surprising.

The rotary gap that I am using was built to run perfectly true, the rotating electrodes were spaced evenly and the stationary electrodes were constructed to break the spark evenly and sharply. The motor which I use is a one-fourth horsepower induction motor running at a speed of 1800 R. P. M. The shaft has no end play whatever. The disc is 12 inches in diameter and on this disc I mounted 12 electrodes, made of one-fourth inch brass rod turned down to points. This was found necessary in order to produce a clear spark.

I break the spark straight across the disc, there are other means of breaking the spark but I have found this method to be superior to any other. The stationary electrodes are mounted on hard rubber posts, the studs being constructed from brass strips, filed to points.

I use one complete turn in the primary of my oscillation transformer which gives a wavelength of exactly 200 meters. The tone of the spark gap that I have just described is not only beautiful to listen to, but it carries exceptionally well.

For receiving I employ a two step amplifier, using the audion tube as a detector.

Proving Our Statements

We quote herewith the contents of a letter submitted to us by a commercial land station operator who replies to the poetry and cartoon entitled "Malicious Interference From an Amateur's Viewpoint" as published in the January issue of this magazine: Editor "Pacific Radio News,"

Dear Sir:

Your initial issue of the "Pacific Radio News" on hand and you cannot imagine how surprised I was to see such an excellent publication. I hope that you will be able to keep up the good work and send me a copy monthly, the subscription price being enclosed. I note that you published a piece of poetry entitled "Malicious Interference" that is supposed to be the amateur's point of view. Again I note that the contents of your magazine are based on facts and you desire to please both the commercial and amateur reader. In order to prove this statement, I am submitting the commercial operator's point of view as regards the amateur interference question, together with a cartoon that I would like to have you publish in the February issue. My poem follows:

There's a station out at Crocker tract,
It rarely has a quiet night
Because the Kiddies interfere
And Jamm their coupling tight.

The Commercial man is sore at heart,
For when some far-off ship he'll start
6OHL and all the rest
Are celebrating a big "Ham Fest."

The QRB's of dozen ships
Are lost by QRM from "dips"
Who fool around with a squeaky
spark
As soon as the nights begin to dark.

It's true indeed, a Ham was I
Before the U. S. Laws passed by
Our Friends in Congress—who said
to us:

"Keep on 200, don't make any fuss."

But the Hams don't follow up the law
And things they do are surely raw.
I'll quote a few of the many words
That the Hams send out in flocks like
birds:

"Does my spark seem clear tonight?
I have the windows open—the neighbors I will fright.
Shall I run my rotary up and down?
Let's stay up all night and hear Capetown."

That is what I hear each eve
And when it's time for me to leave,
I go right home and in bed I lie,
Wishing that the Hams would forever die.

NOT A COPY LEFT

We cannot supply any back copies, the last copy has been sold. All subscriptions start with the current issue.



The Commercial Operator's point of view as regards the interference question

When An "S. O. S." Came True

(By F. L. Comins)

Pearce was the new assistant on the "Altonompah," a small freighter plying between San Francisco and Honolulu. It was his first sea trip and the things that interested him were many indeed until they passed the light-ship, stationed several miles off the heads. A sharp wind was encountered which the ship met head-on and an unpleasant pitching and rolling motion was the result.

Shortly after, Martens, the first operator, entered the wireless room and found the aforesaid assistant stretched full length of the bunk with a pale look on his face. To say that he was seasick would not be doing justice to this expression. After consoling his unfortunate assistant with mild words, he suggested that salt pork for dinner would be a helpful antidote. Martens departed. In due course of time Pearce recovered from his first attack of seasickness.

Martens, it must be known, had a queer sense of humor, and when Pearce innocently mentioned the fact that he wondered how the lights on the buoys are lit, Martens remarked that a man was sent from shore each night in a row-boat to accomplish this task. Pearce remained silent, wondering what would happen if the party in the row-boat was addicted to the use of seasick pills.

Martens, upon perceiving that there was an opportunity to play a little joke on Pearce, cautiously confided a plan to the First Mate, a plan that would afford a great amount of amusement at Pearce's expense.

Accordingly, about one thirty in the morning when Pearce was holding down the graveyard watch, two figures might have been seen cautiously crawling up behind the wireless cabin. Under his arm Martens carried a small box containing a complete buzzer test set.

Listening for a few moments to assure himself that Pearce was not using the transmitter, Martens motioned the Mate to remove the aerial lead from the entering tube, and hastily connected the buzzer lead to the insulator lug.

Then with a grin playing around the corner of his mouth, and uttering a faint chuckle, Martens returned to the buzzer key and sent out that terrible call of "SOS." "Longitude 175 E., Latitude 98 W., SOS SOS RTY RTY," were the signals that issued from the buzzer set. Martens quickly removed the connection from the lead-in, when he heard two faint rings of the signal bell in the engine room below. Pearce was ringing for juice. He rushed to the door of the cabin and found Pearce still frantically ringing the engine room bell.

"What's up?" Martens shouted. "The RTY, she's sending SOS, she's sinking!" Pearce replied. It was the "Eastern Pacific," one of the largest ships on the Pacific Coast, the ship that had fought the hardest storms that had ever swept the Pacific.

Pearce reached for the starting box handle and the motor started with its weird whirl, he threw the switch and reached for the key.

"Get off that key," shouted Martens, "let me in there."

Martens placed the fones on his head and released the starter handle on the box.

Easily he seated himself in the swivel chair and lit a cigarette. His face turned white, he pressed the fones to his ears, he shivered, and this is what he said: "Great God almighty, she's on fire,—assistance is what she wants."

Martens swung around to the wall phone, called the bridge and informed the Mate that the "Eastern Pacific" was sinking and needed assistance.

"Tell 'em we're on our way," said Johnson, and he hung up the receiver.

Again to the apparatus Martens turned, nimbly his fingers sent the reply to the "Eastern Pacific," stating that the "Altonompah" was speeding to the rescue.

The lifeboats were launched from the rescuing ship, only the passengers and First Mate remaining aboard. As the last boat pulled away from the "Altonompah" Martens poked his nose through the wireless room window and saw the Mate pick up a small box from the deck behind the wireless room and throw it over the railing.

RADIO CLUB ARTICLES WANTED

We are in need of radio club proceedings for publication in this magazine. Secretaries of various radio clubs are requested to furnish us with a monthly article regarding the proceedings of their organization. Photographs of club members and stations are highly desirable. These articles will be published under the head of RADIO ORGANIZATIONS.

CHECKERS BY WIRELESS PLAYED NIGHTLY IN SAN FRANCISCO

The first checker game by wireless in San Francisco was played between Mr. H. C. and T. B. Brown on December 23d, the game starting at 10:05 p. m. The moves were followed with great interest by numerous amateur and commercial operators who were fortunate enough to "listen in" on Dec. 23rd.

A large checker board was plotted, the boards being numbered and lettered in the same manner at both stations.

The game was called a draw at 3:15 a. m. the following morning, neither of the players being able to take the remaining checker. A copy of the revised checker board complete with all coded abbreviations for moves and spaces will be furnished by the Secretary of the S. F. Radio Club. Mr. S. S. Foster of San Francisco will challenge the winner of any checker game played via wireless in the vicinity of San Francisco.

Prizes will shortly be offered by the club to winners of these games.

NEWSBOYS DO NOT SELL THIS MAGAZINE ON THE STREET BUT—

Your news dealer will supply you with a copy. Insist on getting the "Pacific Radio News" because it is based on facts.

IF YOU HAVE ANYTHING TO SELL—

Use our Classified Advertising columns. They are open to all, are read by 10,000 wireless operators throughout the country and they are sure to bring results. It will pay you to insert a 10 word trial advertisement in these columns at the rate of 2 cents per word. Stamps accepted.

HALL CUNNINGHAM

Radio Apparatus is manufactured on the Pacific Coast for Pacific Coast Experimenters with particular regard for Pacific Coast conditions.

Our line includes:

Six styles of loose couplers

Four types of Crystal Detectors

Three styles of Rotary Gap

Besides Receiving Sets, Vacuum Detector Panels, Fixed and Variable Condensers, also a large stock of parts for building your own apparatus, comprising Binding Posts, Hard Rubber, Contacts, Fibre, Switches, etc., etc.

Haller Cunningham Electric Co.

428 MARKET STREET

SAN FRANCISCO, CALIF.

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

MARTIN VIBROPLEX, MODEL X—Good condition, suitable for wireless work when used in connection with relay. Will sell for \$10.00. Box 122, PACIFIC RADIO NEWS, 50 Main St., San Francisco, Cal.

BLITZEN IDEAL TUNER—Good condition. Clapp Eastham type. Original cost \$15.00. Will sell for \$6.00, prepaid. E. W. RADFORD, 4608 18th St., San Francisco, Cal.

VARIABLE CONDENSER FOR SALE—31 plate Halcun type enclosed in oak case with hard rubber top and scale engraved in same. Can be used to advantage in audion circuits; is provided with switch to cut out or short circuit. Plates spaced 1-32 inch. In good condition. Have no use for same. First \$5.00 cash takes it, prepaid to any part of the United States. W. M. GRIFFITH, 737 Shrader St., San Francisco, Cal.

WATCH THIS SPACE FOR BARGAINS—Closed core arc lamp reactances will control 1. K. W., each 75c. Watch for next month's ad. It will surprise you. RADIO BARGAIN HOUSE, 1247 47th Ave., San Francisco, Cal.

SAVE MONEY by purchasing that new apparatus thru me. I can save you \$\$\$\$\$\$ on almost any instrument or apparatus. Write for quotation on instrument in which interested. Special: Genuine Double Filament Audiotrons, prepaid, \$4.35. With every order for six, one Blitzen 43 Plate Variable FREE. Double Filament Improved Electron-Relays, prepaid \$4.00. (Please enclose stamp). BRAINERD STRATTON, Oneida, N. Y.

CLAPP EASTHAM OSCILLATION TRANSFORMER—1 K. W. Original price \$15.00. Sell for \$5.00. Good condition. S. FOSTER, 3452 16th St., San Francisco, Cal.

HALCUN \$12.00 Rotary \$5.00. Home-made Rotary \$4.00. De Forest Bulb Audion \$4.00. Electron Relay \$4.00. H. R. LEE, Sec.-Treas., S. F. R. C., 1580 Grove St., San Francisco, Cal.

MOTORCYCLES

A BARGAIN—1913 Twin Excelsior 7 H. P. Excellent condition. Has detachable tandem, Presto with headlight, gas saver, extra heavy chain drive, hand klaxon, etc. First \$65.00 cash buys this machine. Box 121, PACIFIC RADIO NEWS, 50 Main St., San Francisco, Cal.

THE NEW BRANCH CATALOG

The Joseph G. Branch School of Engineering, of Chicago, Ill., have just issued their catalog No. 6, describing their different correspondence courses of study.

This school is one of the best known correspondence schools in the country, having been established some years ago by Joseph G. Branch, a well-known engineer and writer of practical books on engineering and electricity.

It is said that their courses of study are made so simple and plain that anyone with only a fair education can readily understand them, and that the success of this school is largely due to the fact that they teach only what the student must know to become a high-class engineer or electrician, without wasting his time and effort on superfluous matter.

In their different courses of study, each question is so arranged that it leads up to the next question, until the entire course of study is completed. The student is graded by the instructor in charge of his work, and the graded answers returned to the student with full instructions, so that he can see at all times what mistakes he may have made and the grade made by him upon each of his answers for the entire course of study.

Upon completing the course, the student is awarded a diploma, and every assistance is rendered him in obtaining a good position. With each course of study is supplied standard modern text-books which are used by the student in his studies, these books becoming the property of the student.

Their new catalog shows a great number of splendid testimonials from students in every section of the country, and also the high-class positions obtained by them through their having been a student in this school. The high standing of the officers and faculty of this school is a guarantee to

everyone of satisfaction and they refer to any of their students as the best of all of their recommendations.

This catalog is sent to anyone without charge, upon request, and as it contains a great deal of valuable information, it will be of special interest to engineers, electricians, machinists, firemen and applicants for engineer's license throughout the country.

FIVE AMATEUR STATION ROBBERS CAUGHT

The amateur station robbers referred to in our January issue have been caught by Detective Thomas J. Stanton and Mr. T. J. Ryan, Sergeant-at-Arms of the San Francisco Radio Club.

Mr. T. J. Ryan endeavored to gain admittance to his basement on the evening of December 16th and found it difficult to open the door. He forced his way into the basement and found the seventeen year old thief hiding behind the door. After several minutes of grappling, Mr. Ryan succeeded in throwing his opponent to the floor, holding him in this position until a neighbor summoned help from the local police department. He was taken to the Park Police Station and stated that his name is Benjamin Carrolls, age seventeen. He has already served time in the Detention Home, together with two brothers, who are still serving time in the same place. Carrolls stated that he had no intention of robbing the basement. A search of his person revealed a concealed brass rod, a screw driver, pair of pliers and various other appliances.

Upon being questioned what these tools were being used for, he stated that he is employed by an electrical manufacturer and uses the tools in his home workshop. He is still held in custody

by the police department awaiting trial within the course of a week.

A search of his basement revealed that he was responsible for the looting of at least a half dozen amateur stations. Practically all of the apparatus taken from the stations owned by Mr. A. W. Martin, Mr. T. T. Barnett and Mr. T. J. Ryan were returned to the owners.

Detective Stanton succeeded in trapping four other amateur station robbers, none of them being over twenty years of age. They have been released on probation by the Judge of the Juvenile Court.

Benjamin Carrolls has confessed to the burglaries of several grocery stores in San Francisco and plans for similar future offenses have been unearthed by the detectives.

NEW WIRELESS SCHOOL OPENED

The San Francisco Wireless School, 333 New Call Building, opposite the Palace Hotel, is now open. Under the management of Mr. L. Malarin, Chief Operator of the Marconi Wireless Company, a new and interesting method of instruction has been instituted whereby students completing the school course will be really practical operators and fit to take their place beside those who already have had sea experience.

This has been made possible by arrangement with the Marconi Company, to supply from their Construction Department as many spare and broken parts as may be necessary to demonstrate the installation and repairing of a complete set. Mr. E. L. Stevens, Superintendent of Construction of the Marconi Company, will have charge of the department and every opportunity will be given the students to turn the set inside out, so

to speak. Mr. Stevens will also arrange for students to go out with the Construction Engineers and do repair and installation work on board ship.

The school is equipped with practice tables capable of accommodating fifty students, while in evidence is the 240 cycle synchronous set, a modern panel set and auxiliary coil, valve tuner and other transmitting and receiving apparatus. The display of parts such as transformer sections, core and motor parts and various testing instruments gives the impression of a thoroughly practical school.

Mr. A. Mackenzie, who for the past five years has seen service with the United Wireless and Marconi Company, and who, in his capacity as wireless operator, has visited almost every country in the world, will be in charge of the operating and traffic department and will also devote his time to a course of theoretical instruction to be made as interesting and simple as possible.

The success of Mr. Malarin with his old United School and the excellent positions now held by some of his old pupils is sufficient guarantee for the success of the venture.

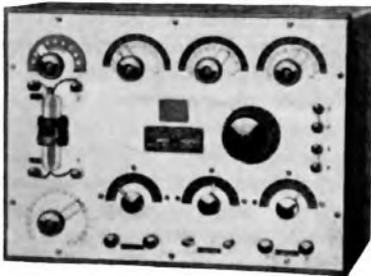
The object of the school is to meet the increasing demand for competent operators and engineers for service at the Marconi high power stations as well as the marine service.

Desired information will be supplied on request.

"SONOMA" MAKES RECORD

Royden Thomberg and Clio Bowers, wireless operators on the Sonoma, which arrived from Australia on January 17th, claimed a world's record for the reception of wireless messages.

They picked up OUI a dozen times and distinctly heard the German messages that flashed over the seven oceans. The distance received was about 12,000 miles.



MIGNON UNDAMPED
WAVE

WIRELESS APPARATUS

AMATEUR and COMMERCIAL USE

This latest Mignon invention is entering a new field in Radio Engineering, eliminating the so familiar LOOSE COUPLERS and LOADING COILS, and introduces adjustable DISC-CORES, heretofore considered impossible. DISTANCE RANGE UNLIMITED.

MIGNON WIRELESS CORPORATION

ELMIRA, N. Y., U. S. A.

Write for Catalogue and mention
Pacific Radio News



GALENA

Specially Selected Crystals
for Wireless Use

TESTED CRYSTALS TWENTY CENTS PER OUNCE

D. B. McGOWN

1247 Forty-seventh Ave.

San Francisco, Cal.

DOES THE TITLE OF

RADIO OPERATOR

SOUND GOOD ENOUGH TO YOU—

Or have you a higher ambition—
the ambition to become a

RADIO ENGINEER

Can you apply yourself to a good book on the fundamentals and essentials relating to the Radio Engineer's profession?

You can secure one of these three books by securing ten subscriptions to "Pacific Radio News." Here they are:

ALTERNATING CURRENTS SIMPLIFIED

By Elmer E. Burns, B. S.

How Alternating Currents Are Produced.
What Is an Alternating Current?
Magnetic Force of an Alternating Current.
What Is Self-induction?
What Is Capacity?
Curve Tracing.
Phase and Frequency.
Volts and Amperes in an A. C. Circuit.
Power Factor.
Choking Coils.
Magnetic Power Losses.
Transformers.
Converters and Rectifiers.
Transmission of Power, Etc.

ELECTRIC WIRING

By Joseph G. Branch, B. S.,
M. E.

Interior Wiring.
Power Transmission.
Electric Railways.
Telegraphy.
Wireless Telegraphy.
Direct and Alternating Currents.

Electricity at High Pressures
and Frequencies, by Henry
L. Transtrom.

This work is a practical treatise of some of the wonders of high-frequency currents at high and other potentials, and should be in the hands of every electrician and engineer who desires to keep abreast of the times.

Send your ten addresses and names with ten dollars to Pacific Radio News, 50 Main Street, San Francisco.

PUBLISHERS OF "PACIFIC RADIO NEWS"

We feel that statements which we have made from time to time regarding the publishers of "PACIFIC RADIO NEWS" have not been as congruent as they might have been. At the outset the San Francisco Radio Club undertook to publish "PACIFIC RADIO NEWS" but for pecuniary reasons the present staff (which was originally elected from the membership of the club) decided to take the matter entirely into their own hands and operate under the company name of PACIFIC RADIO PUBLISHING COMPANY.

(Signed) P. R. FENNER, Manager.

OUR LOOSE LEAF CATALOG

WILL BE READY FOR DISTRIBUTION ON JAN. 20.

A copy of it will be sent to you on receipt of Ten cents in stamps or coin. Write now as first edition is limited.

Department C2.

THE RADIO DISTRIBUTING CO.

Lombard

Illinois



WIRELESS

 <p style="text-align: center; font-weight: bold;">This fellow doesn't read QST</p>	<h2 style="margin: 0;">Fellow Amateurs</h2> <p style="margin: 0;">QST is the amateur magazine; the contents are written for us amateurs, by amateurs who know the "Real Dope". QST with its sixty-four pages of radio articles is the only thoroughly amateur wireless magazine. Order today and see.</p> <p style="margin: 0;">\$1.00 per year; 10 cents per copy</p> <p style="margin: 0;">The QST Publishing Company, Inc.</p> <p style="margin: 0;">25 Oakland Terrace, Hartford, Conn.</p>	 <p style="text-align: center; font-weight: bold;">This fellow reads "QST"</p>
--	--	---

When writing to Advertisers please mention this Magazine

COMPLETE LINE OF
STORAGE BATTERIES
 AND
DRY CELLS

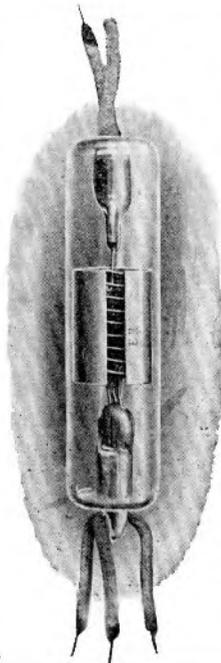
FOR RADIO AND AUTOMOBILE SERVICE

Electrical Machine Work — Battery Charging

THOMPSON-LARZELERE CO.

543 Van Ness Avenue

San Francisco



Special Offer!

ELECTRON RELAY

Guaranteed Daylight Signals From
Honolulu.

Double Filament, 1000 Hours.

Sent Prepaid	\$4.50
45 Volt "B" Battery	\$4.00

Panels, Rheostats, Switches, Etc.

Send for Full Details
And Mention "Pacific Radio News."

ELECTRON AGENCIES

4608 18th St.

San Francisco, Cal.

IN practically every land station,
 almost every ship station,
 hundreds of naval stations,
 thousands of amateur stations,
 and
 almost every army station in the
 United States

**YOU WILL FIND THE
 "PACIFIC RADIO NEWS"**

It is read by thousands of boosters in every
 part of the country.

If you happen to meet a commercial or amateur
 operator on the Pacific Coast and ask him what
 magazine he reads, he will invariably tell you that
 he is a subscriber to the "PACIFIC RADIO
 NEWS."

ARE YOU A SUBSCRIBER ?

**IF NOT, DO NOT FAIL TO MAKE USE OF THE SUBSCRIP-
 TION BLANK AND SEND US YOUR DOLLAR TODAY.**

The March issue will be a crackerjack, it will contain some of the
 best articles on radio communication that have ever been published.
 The finest photographs, the best cartoons and diagrams. Profusely
 illustrated by men who know the game from A to Z.
 Please do not send stamps.

Please do not send stamps.

Tear along this line.

"Pacific Radio News"

P. R. FENNER, Manager
 50 MAIN STREET, SAN FRANCISCO, CAL.

.....19.....

I hereby subscribe to the "PACIFIC RADIO NEWS" for

.....years to start with the.....issue.

Subscription rate: **Signed**.....
 \$1.00 per year, **No.**..... **Street**.....
 payable in advance. **City or Town**.....
 Make all checks payable to the **Pacific Radio Publishing Co.** **State**.....

What Do You Really Want In Your Apparatus?

You certainly do not want the average and commonplace results obtained from stock instruments, which are made simply to sell. You want distinctive, and noteworthy results, that will make your equipment the talk of the town. In a word, you wish our apparatus.

We carry no stock of apparatus, made up to any standards in all respects; we design apparatus to suit the needs of your station exclusively. In every station the conditions are very different, and it stands to reason, if you give the matter a moment's thought, that these differing conditions give rise to different problems in every installation. Drop us a line, giving your own personal requirements, and all the essential details of your station; tell us just what you want to do, and what results you wish to obtain, and we will give you a price that will surprise you.

Efficient Radio Apparatus Company

1338 MASONIC AVE., SAN FRANCISCO

THE SAN FRANCISCO RADIO CLUB

*A MEMBERSHIP ORGANIZATION INCORPORATING
COMMERCIAL AND EXPERIMENTAL RADIO OPERATORS*

The Club Room at 350 Frederick Street has been vacated and a new and more elaborate Club Room at 218 Haight Street is now open.

This change was made necessary by the ever-rising membership.

Meetings held every Friday Evening at 8 o'clock.

Initiation Fee, \$2.50 Monthly Dues, 25 cents.

Application blanks will be supplied on request.

All San Francisco and Bay District Commercial and Experimental Radio Operators are desirable members.

Social Meetings held Bi-Weekly on Friday Evenings.

Interesting Lectures frequently delivered.

The San Francisco Radio Club is acknowledged to be the best organized Radio Club on the Pacific Coast.

Any information will be supplied by the Secretary, Mr. H. R. LEE, 1580 Grove St., San Francisco, Cal.

A Complete, Practical Correspondence Course of Study in
Electrical Engineering

Competent Electrical Engineers are in demand

If you wish to earn a **BETTER SALARY**, here is a chance to get your **diploma** at home during your spare time. **Men in constant demand everywhere. Big salaries** being paid for competent **Electrical Engineers**. We have helped hundreds and can help you.

The men who get the **big jobs** are the men who understand the **principles** of electricity and their application. **Let our graduates tell you what we have done for them.**

Our **Course in Electrical Engineering** teaches in plain, simple language and with easy lessons how to install and operate the most modern electrical machinery and appliances.

These lessons in **Practical Electricity** cover both **Direct and Alternating Currents**, high potential and high frequency currents, and all that is necessary to make you a proficient electrical engineer.

The Course completely covers the field of electrical engineering, including power-plant work, and covers the following subjects, viz.: **Practical Electricity, Alternating Currents, The Electric Motor, Practical Mathematics and Electrical Wiring.**

WRITE AT ONCE

For Our Present

SPECIAL PRICE and TERMS

These Books Free!

With this course of study you get **FREE** the following splendid text books, all **standard works**, which books alone are worth more than the price of the entire course of study.

You get **personal instruction** from the leading instructors in this country on a **complete course in Electrical Engineering**, every detail of which is covered in the following books:—

- Practical Electricity**
- Alternating Currents Simplified**
- The Electric Motor**
- Electric Wiring**
- Practical Mathematics**

The instruction is so clear that anyone can understand it, even though he has but a limited education.

Some of our students have been able to complete the course in three to six months. If you can not devote much time to study, it will take a little longer.

Send for Complete Catalogue, Testimonials & Positions Secured

Complete Practical Correspondence Courses Covering:

STATIONARY ENGINEERING	POWER ENGINEERING	PRACTICAL MATHEMATICS
ELECTRICAL ENGINEERING	POWER PLANT ACCOUNTING	DRAWING AND DESIGNING
MECHANICAL REFRIGERATION	PRACTICAL CHEMISTRY	MECHANICAL DRAWING

THE PRICE IS LOW AND THE TERMS ARE EASY

Send the coupon at once and we will write you, giving you complete information and our present **Special Terms.**

Please send me full information concerning your course in Electrical Engineering, and Special Terms.

Name..... Street and Number.....

City or Town..... State..... Present Position.....

The Joseph G. Branch SCHOOL OF ENGINEERING
 542 SOUTH DEARBORN ST. CHICAGO, ILLINOIS

3000 MILES
ON
200 METERS

WITH

500 WATTS
IN DAY TIME

CAN YOU DO IT? NOT YET!

BUT
SOON

You can be the local representative of "PACIFIC RADIO NEWS" if you are wide-awake, honest and industrious. Apply for the agency and make money in part or all of your time.

Write P. R. FENNER, Mgr.,

PACIFIC RADIO NEWS

50 Main Street

San Francisco, Cal.



“Albany”

WIRELESS SPECIALTIES

METERS

These meters were designed especially for the Wireless Trade. The A. C. Volt and Ampere Meters are of the repulsion type and are accurately calibrated.

PLAIN
OPEN
SCALE

BLACK
FIGURES
ON
WHITE
DIAL

HEAVY
BEVELED
GLASS



NEAT IN
APPEAR-
ANCE
LIGHT
WEIGHT
FIVE
OUNCES

DIAMETER
OF BASE
3 IN.

ALL
PARTS
HIGHLY
FINISHED

PRICES

HOTWIRE AMMETER, 0 to 600 Milli-Amps.	\$4.50
Hotwire Ammeter, 0 to 1 Ampere.	3.50
Hotwire Ammeter, 0 to 3 Amperes	3.50
Hotwire Ammeter, 0 to 5 Amperes	3.75
VOLTMETER, 0 to 125 Volts, A. C.	8.50
Ammeter, 0 to 10 Amperes, A. C.	8.00

Have You a Copy of Our New Raw Material Catalog "F"?

MAGUIRE & SHOTTON

ALBANY, NEW YORK

Western Representative
RAD COOVER



1613 19th Street
Sacramento, Cal.