

B6

PACIFIC RADIO NEWS

*Pioneer Journal of
Western Radio News and Development.*

warning!

Never buy a vacuum tube advertised as both a detector and an amplifier—no, not at any price. A vacuum tube can be either a detector or an amplifier, but **no one tube can efficiently serve both purposes.** That is an established fact. You know it. Only a **combination** of tubes provides all necessary operating characteristics without compromising essential features. And the **A-P Vacuum Tube Combination** is the one such proven combination on the market today.

The **A-P Electron Relay** is the most sensitive spark detector known to the radio art. It is a soft tube. It contains the right quantity of gas, and, equally important, the right kind of gas. The electrodes are correctly designed. You know this tube will give you results. On the market since May, 1920, it has made good in actual use.

A combination of two or more A-P VT tubes as amplifiers with an A-P Electron Relay as the initial detector or oscillator is the ideal receiving combination for long distance amateur or long wave reception. *Only with such a combination can full efficiency and best results be obtained*

When you want an **efficient** amplifier in which none of the amplifier qualities are sacrificed to make it also a detector, use the **A-P VT Amplifier-Oscillator.** When you want an **efficient** detector in which none of the detector qualities are sacrificed to make it also an amplifier, use the **A-P Electron Relay.**

For sure results, for better results use A-P Tubes and only A-P Tubes—built up to quality, not down to price—the A-P Vacuum Tube Combination. Equipped with the SHAW standard four-prong base. Manufactured under the DeForest Audion and Fleming patents. Other patents applied for and pending. The A-P VT Amplifier-Oscillator—price \$7. The A-P Electron Relay—price \$6. Order from your dealer.

PACIFIC RADIO SUPPLIES CO.
638 Mission St., San Francisco, Cal.

ATLANTIC RADIO SUPPLIES CO.
8 Kirk Place, Newark, New Jersey

Distributors for the Moorhead Laboratories, Inc.



It Merits Your

Investigation

Demand Cunningham Tubes

The Name is etched
on the glass



Type C-300

The Ideal Amateur Tube

\$5.00

Cunningham Audiotron Tubes

WITH STANDARD FOUR PRONG BASE

THESE tubes embody all the knowledge and skill of many years research by the leading vacuum tube engineers. The New CUNNINGHAM TUBES are manufactured to rigid specifications in the world's largest vacuum tube factory. Quantity production by machinery makes possible the remarkable price.

Receiving tubes are of two general types. The high vacuum Navy type of rigid operating specifications for radio and tone frequency power amplification. Plate and filament adjustment are not critical. Detector properties are sacrificed to provide maximum amplification in multi-stage and complex circuits without distortion. An amplifying tube is necessarily an oscillator.

The gas content type designed for maximum signal audibility and sensitiveness in detector circuits.

CUNNINGHAM TYPE C-300

is of the latter class and its combination properties exceeded the expectations of its designers. The plate requires only 22½ volts—a single block cell. Maximum sensitiveness is always between

SEE YOUR DEALER TODAY and get your copy of Bulletin C-300 describing these new tubes. If your dealer cannot supply you send us his name and address and we will mail you a copy without charge.

Cunningham tubes are covered by patents dated 11-7-05, 1-15-07, 2-18-08, and others issued and pending. Licensed only for amateur or experimental uses in radio communication. Any other use will be an infringement.

Service and Quality since 1915

Guaranteed by

TRADING AS

AUDIOTRON MFG. COMPANY

35 MONTGOMERY ST., DEPT. N

SAN FRANCISCO

DEALERS-JOBBERS

You will be interested in my proposition on the new tubes with the standard four prong base, packed in attractive individual cartons. **DELIVERIES FOR 60 DAYS NECESSARILY IN ROTATION.** Write today for full details.

18-22½ volts. In addition to its wonderful detector properties, low B battery, quietness in operation, it functions as a tone frequency amplifier and is a free and persistent oscillator for regenerative amplification and CW reception. The pleasure and satisfaction from operating this tube cannot be described. Price

\$5.00

Cunningham Type C-301 High Vacuum Amplifier

is the most efficient and stable amplifier ever produced and meets the demand for the Navy type amplifier and regenerative receiver. The exhaust is carried to a high stage permitting operation at plate voltages from 40 to 100 with increasing amplification. Amplification constant 6.5-8 at 40 volts plate and 8-10 at 100 volts. Filament operates on 6 volts with rheostat. Try C-301 in your multi-stage amplifier with loud speaker. There is a surprise waiting for you. Price

\$6.50



The Big Store on the Corner

SEND FOR OUR CATALOG

Ask Your Dealer To Show You Our Goods

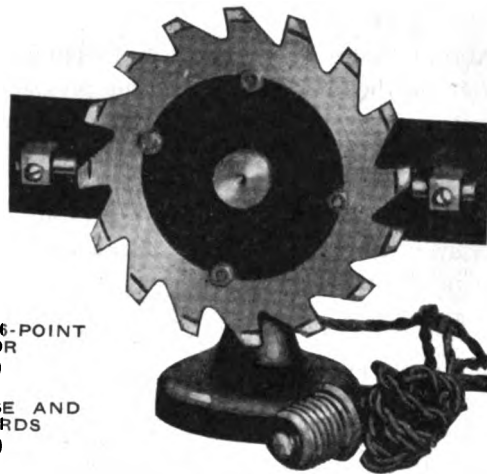
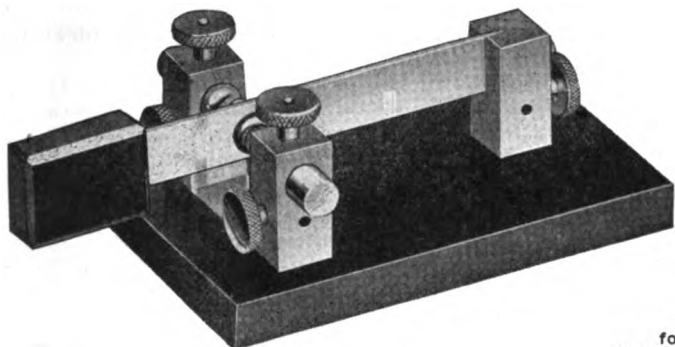


MANUFACTURERS—JOBBER—RETAILERS

ROTARY GAP No. YM-1

A new development in the rotary line has been made expressly for Young & McCombs. Improvements on the well-known saw tooth rotary wheel make this gap the equal in tone and efficiency to any selling for twice the money. It is the only gap on the market which will run smoothly and reliably in either a horizontal or vertical position. Can be run in a vertical position while screwed to the wall. Rotor is machined cast aluminum with formica center. Has liberal sparking space and is drilled for either 1/4 or 3-16 shaft. Variable motor speed switch in base.

PRICE—Completely Assembled—\$16.00



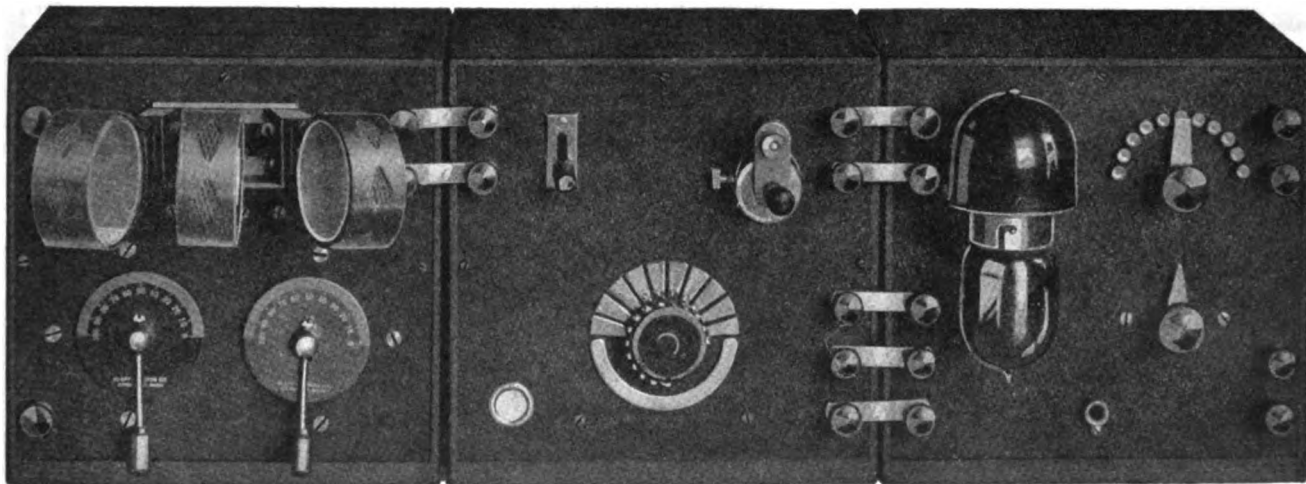
SAW-TOOTH 16-POINT ROTOR
\$4.50

ROTOR BASE AND STANDARDS
\$7.00

“COOTIE” KEY No. YM-6

The “Cootie” key is the snappiest sending device offered on the market for reliable spacing of characters. Large standards, formica knob, substantial silver contacts suitable for use up to 2 KW. The double action of the “Cootie” key lends an individuality to your sending. Price, Nickel-plated \$8.00.

UNIT SECTIONAL CABINET RECEIVERS



YM-7b

YM-9

YM-4e

A typical unit sectional cabinet receiver is here shown. We are the sole originators and designers of this type of receiver. Cabinets are of quarter sawed oak with “Early English” finish. Bakelite panels. Audion cabinet contains 60 volt variable “B” battery. This set, with proper honeycomb coils, is operative from 150 to 20,000 meters. Amplifiers may be added to these sets in any number. The crystal detector cabinet includes an enclosed buzzer and battery. All instruments can be supplied separately or in complete sets.

TUNERS
YM-7b—With plain mount.....\$29.50
YM-7a—With geared mount..... 32.50
(Less Coils)

CRYSTAL DETECTOR
YM-9 Complete with test buzzer
and battery\$24.50

DETECTORS-AMPLIFIERS
YM-4e Detector\$25.00
YM-6e Amplifier 31.00
(Less Bulbs)

WESTERN REPRESENTATIVE—LEO. J. MEYBERG CO., SAN FRANCISCO, CALIF.

When writing to Advertisers please mention this Magazine



The Recognized Symbol of Superior Performance

Amrad Radio Products enjoy distribution in every district of the United States and in Canada. They are recognized as the fastest growing line of quality radio apparatus on the market.

The dealers listed below are Amrad Dealers and have been carefully selected because of their experience in the radio field and their known reliability in

business. They are prepared to fill immediately from stock all orders for any advertised Amrad Product and, in addition, give **real Amrad Service** to operators everywhere.

Visit your Amrad Dealer. See for yourself the latest in radio design and let him help you meet your needs.

FIRST DISTRICT

C. B. Chase, 94 Railroad St., St. Johnsbury, Vt.
DeLancey Feich & Co., South Lancaster, Mass.
F. D. Pitts, Co., 12 Park Square, Boston, Mass.
Rhode Island Electrical Equipment Co., 45 Washington St., Providence, R. I.
Smith & Emerson, 18 Church St., Pittsfield, Mass.

SECOND DISTRICT

American Electro Technical Appliance Co., 235 Fulton St., New York City.
Continental Radio & Electric Co., 6 Warren St., New York City.
Westchester Electric Appliance Co., 253 South Broadway, Yonkers, N. Y.

THIRD DISTRICT

Philadelphia School of Wireless Telegraphy, Parkway Bldg., Philadelphia, Pa.
Shotton Radio Manufacturing Co., Box 3, Scranton, Pa.
Meeks-Collins Electric Co., 411 Granby St., Norfolk, Va.

FOURTH DISTRICT

Carter Electric Co., 63 Peachtree St., Atlanta, Ga.

FIFTH DISTRICT

Hurlburt-Still Electrical Co., Capitol Ave. & Fannin St., Houston, Texas.

Nola Radio Co., 143 Chartres St., New Orleans, La.
Southwest Radio Supply Co., Dallas, Texas.

SIXTH DISTRICT

Arno A. Kluge 638 S. Figueroa St., Los Angeles, Cal.
California Electric Supply Co., 643 Mission St., San Francisco, Cal.
Western Radio Electric Co. 550 South Flower St., Los Angeles, Cal.
Southern Electrical Co., Third & E Streets, San Diego, Cal.

SEVENTH DISTRICT

Glasgow Electric Shop, Orpheum Bldg., Glasgow, Montana.
Northwest Radio Service Co., 609 4th Ave., Seattle, Wash.

EIGHTH DISTRICT

Radio Electric Co., 4416 Henry Street, Pittsburgh, Pa.
Barker Fowler Electric Co., 114 North Grand Ave., Lansing, Mich.
McCarthy Bros. & Ford, 75 Mohawk St., Buffalo, N. Y.
Northern Radio Laboratory, 111 Main St., Clyde, Ohio.
H. L. Walker Co., 185 Jefferson Ave., East, Detroit, Michigan.
Radioelectric Shop, 919 Huron Road, Cleveland, Ohio.
Rudolph Schmidt & Co., 51 Main St., East, Rochester, N. Y.
Precision Equipment Co., 2437 Gilbert Ave., Cincinnati, Ohio.

NINTH DISTRICT

Central Radio Co., Inc., Central Bank Building, Independence, Mo.
Chicago Radio Apparatus Co., 3400 S. Michigan Ave., Chicago, Ill.
Cosradio Co., 1725 Fairmont Ave., Wichita, Kansas.
C. E. Goddard, Shawnee, Kansas.
Klaus Radio Co., Eureka, Ill.
Linze Electrical Supply Co., 1129 Olive St., St. Louis, Mo.
Tafel Electric Co., 236 W. Jefferson St., Louisville, Ky.
U. of I. Supply Store, Champaign, Ill.
Great Lakes Radio Supplies Co., Inc., First National Bank Bldg., Elmhurst, Ill.
Young & McCombs, Rock Island, Ill.

CANADA

Scientific Experimenter, Ltd., 33 McGill College Ave., Montreal.
Scientific Experimenter, Ltd., Dominion Building, Vancouver, B. C.
Scientific Experimenter, Ltd., 410 Confederation Life Bldg., Winnipeg, Manitoba.
Scientific Experimenter, Ltd., 93 King St., East, Toronto, Ontario.
Scientific Experimenter, Ltd., 1 Arcade Bldg., Hollis St., Halifax, Nova Scotia.
Scientific Experimenter, Ltd., Board of Trade Bldg., St. John's, Newfoundland.
The Vaughan Electric Co., 94 Germain St., St. John, New Brunswick.

In most cases your dealer can supply you with the latest Amrad Bulletins. If not, write us. If an Amrad Dealer does not happen to be in your immediate vicinity send us the name of your nearest dealer and we will be pleased to send you the up-to-date Amrad Catalog.

AMERICAN RADIO AND RESEARCH CORPORATION

Address all Communications to New York Office

2420 Park Row Bldg.
New York

Factory and Laboratory
Medford Hillside, Mass.

When writing to Advertisers please mention this Magazine

ARE YOU GOING TO BE Satisfied With Obsolete Apparatus

or are you going to start the new year with something new

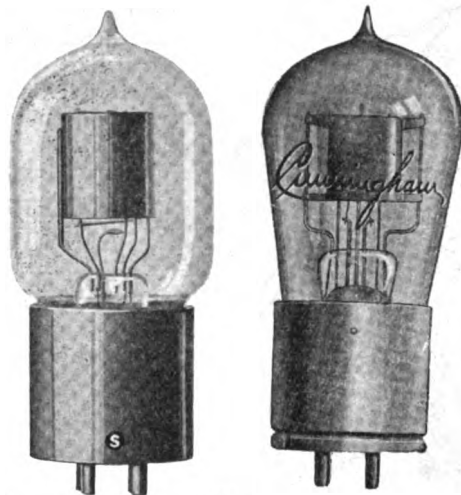
Let Us Give You a Vacuum Tube Free of Charge!

Read this Remarkable Offer and see how easy it is for you to improve your equipment without any added expense

HERE IS THE OFFER:

Get four of your radio friends to subscribe to "Pacific Radio News" for one year. Send us eight dollars for these four subscriptions and 25 cents for mailing charges. We will promptly send you a vacuum tube absolutely free of charge. If you cannot get four individual subscriptions, get two of your friends to subscribe for two years each. These tubes will also be awarded to you if you subscribe as an individual for four years. If you are already a subscriber you can extend your subscription for four years. In short any combination for which you send us eight dollars will be accepted. All tubes are new and genuine and fully guaranteed by the manufacturer

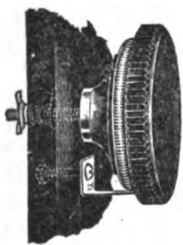
HERE ARE THE TUBES:



When ordering specify whether you want an A.P. V.T. Detector, Oscillator or Amplifier tube or the new Cunningham Audiotron.

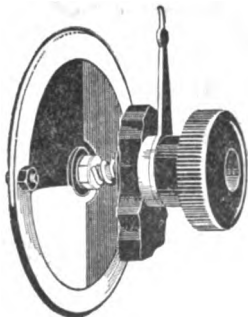
YOU SAVE FROM FIVE TO SEVEN DOLLARS ON THIS OFFER

HERE IS ANOTHER OFFER ON WHICH YOU SAVE FIFTY PER CENT



These instruments retail at one dollar each. Add 10c for postage.


THE NEW PARKIN .001 VARIABLE CONDENSER GIVEN FREE WITH A TWO-YEAR SUBSCRIPTION TO "PACIFIC RADIO NEWS" OR TWO INDIVIDUAL SUBSCRIPTIONS. REGULAR PRICE, \$2.00. All 10 cents for postage.



THE PARKIN PANEL MOUNTING RHEOSTAT OR THE NEW PEN BRAND GRID CONDENSER GIVEN FREE WITH ONE SUBSCRIPTION TO "PACIFIC RADIO NEWS."



DOUBLE VALUE FOR YOUR MONEY—PLAIN AS DAY-LIGHT.

NOW IS THE TIME TO SUBSCRIBE! MAIL THE COUPON TODAY. 

PACIFIC RADIO PUB. CO. 50 MAIN ST. San Francisco

Herewith is

\$.....and..... cents for mailing charges for which you will send "Pacific Radio News" for..... years to:

Name.....

Address.....

You will also promptly send the following apparatus as a premium for the above subscription.

SUBSCRIPTION RATE, \$2 PER YEAR

Signals

The First Americans used to signal with smoke clouds as far as they could see.
Modern Americans now communicate around the world by invisible electric waves.

Whether dots and dashes, or spoken words convey the message, it is the AMPLIFIER which makes long distance radio service possible,—by the mere turning of a switch, you can bring those trans-ocean stations to your ears like magic,—or you can sit back and listen to local stations with your telephones lying on the table.

AND WHEN YOU GET YOUR AMPLIFIER, GET IT FROM THE AMPLIFIER SPECIALISTS.

The "SUPERADIO" Detector and Single Stage Amplifier, with the new Filament Temperature Indicator.

\$45.⁰⁰

The "SUPERADIO" Two-stage Amplifier, with the new Filament Temperature Indicator,

\$55.⁰⁰

The "SUPERADIO" Amplifiers are the BEST. GET THE BEST FIRST, AND NEVER REGRET.

Write for Bulletin 110.

SUPERADIO

CORPORATION
2674 BAILEY AVE.
NEW YORK
SUCCESSORS TO —
L.M. COCKADAY & CO.





The Backbone of a Radio Journal

MANY people engaged in radio work are denouncing the radio publications that contain a large volume of advertising. "Nothing but ads," was the phrase we overheard at a local radio store recently when a prospective purchaser of a radio journal refused to buy either of the four publications on display. If this person would only stop to think that without the ads there would be no radio publications, he would not have made the aforementioned absurd remark.

Advertising, from a timid, fumbling idea, has become not only a science but a business. It has grown large, prosperous and necessary, and without its aid the wheels of modern industry would not spin and the needs of the public would not be so easily answered.

As the advertising of a publication increases the amount of reading matter also increases. Some publications can run a lifetime without an inch of advertising but the story is a different one when applied to radio journals. Not fifty years ago one of the large National monthlies refused \$17,000 for an advertisement of a certain new household necessity. What would the average amateur radio station look like today if the owner had not patronized the advertisers of one radio journal or another?

Do you think for a moment that long distance amateur communication would be possible without the aid of the radio manufacturer in giving us what we need to accomplish the present day unusual feats? Therefore, in order to publish new ideas for the construction of modern radio equipment and bring these

High and Dry

In response to advertisements published in several Eastern radio periodicals last month we were swamped with requests for free copies of our Convention and Christmas number.

As stated in these advertisements the supply of copies was limited, and several hundred requests for copies could not be granted.

We have therefore printed an extra thousand copies of the current issue, substituting it for the Christmas number, and all orders for free copies will be promptly filled.

ideas into your station, you must read the latest radio publications and these publications would not reach your station were it not for the advertising that they contain.

Advertising, like all other useful bodies, has its troubles. Its strength lies in its healthy, constructive qualities, but many of us have learned that it can also be used for destruction.

The work of the honest advertiser is injured by the advertiser who exaggerates or deliberately swindles. And the first need of the honest advertiser is to see that the streams of publicity are kept clean—and that the public is not deceived. The various Representatives of "Pacific Radio News" have instruc-

tions to take particular care when accepting advertising and we do everything possible to see that nothing but truthful advertising enters our columns. If a publication sells its space freely to all sorts of doubtful schemes, it becomes a fellow-conspirator against the public and merely shares in the loot of robbery. It turns over its readers, bound and gagged, to be stripped by swindlers, and it hurts the entire community.

Many radio amateurs can relate a tale of woe as to how they were "jipped" of their hard-earned dollars. In order to crush this unlawful practice we will ask those who are experiencing difficulty in their dealings with radio manufacturers to write us and the proper steps will be taken to curb this state of affairs.

A new organization will soon be introduced to the radio public—The National Association of Radio Dealers, now being established in Omaha, Nebraska. This Association is being formed to give the amateur radio man a square deal in the purchase of his apparatus. It will soon be a great organization. Manufacturers of radio apparatus should not take its purpose lightly. The co-operation of "Pacific Radio News" is pledged in the good work of the Association—we have already been advised that our application for membership has been accepted. The Association will carefully examine the advertising printed in radio journals and protect the amateur in every possible manner—it will create a spirit and a movement that will make the radio business as clean and trustworthy as it must be if it is to continue its growth and usefulness.

New York Office.....147 Sixth Ave.
Boston Office.....18 Boylston St.

Portland Office.....420 Bd. of Trade Bldg.
Chicago Office.....1306 Hartford Bldg.

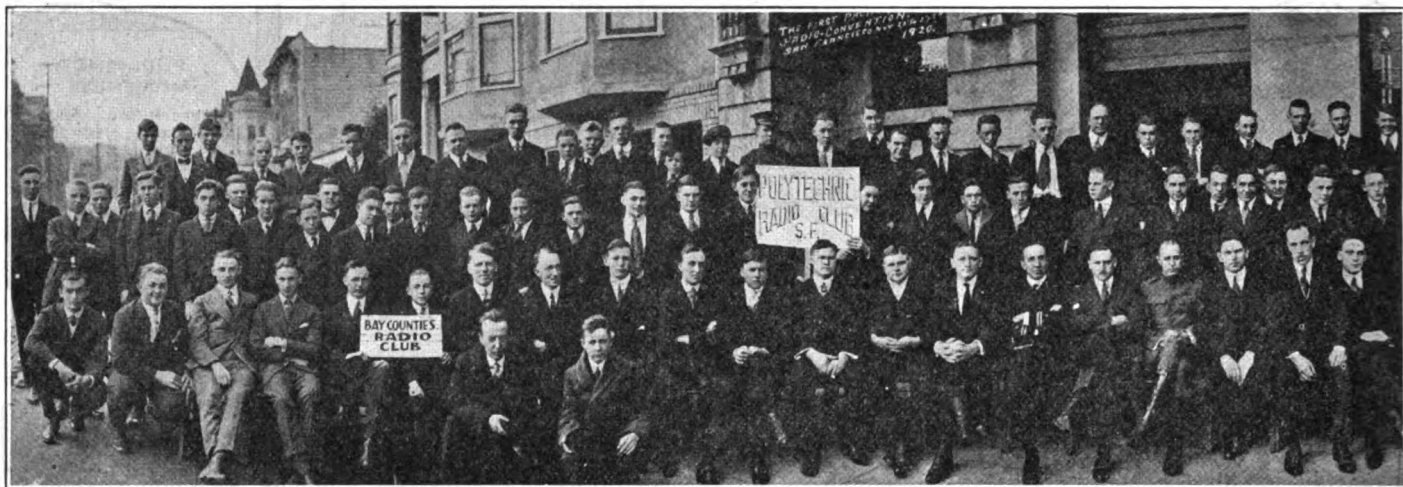
Seattle Office.....419 Pioneer Bldg.
London Office....62 and 8a, The Mall, Ealing

Entered as second class matter January 22, 1920, at the Post Office at San Francisco, Cal., under the Act of March 3, 1879.

Radio Convention is Great Success

Major J. F. Dillon is Made Permanent Chairman.

Pacific Coast Advisory Council is Formed.



The photograph on this and the accompanying page shows approximately one-third of the delegates and radio men who attended the big convention

THE Pacific Coast Radio Convention opened at 10:28 a. m. with the playing of the "Star Spangled Banner" transmitted by radio telephone from the California Theater. The audience consisted of 580 radio men. The opening address was read by the secretary to Mayor Rolph of San Francisco and outlined the importance and significance of the radio convention. The secretary then closed his address with the introduction of Mr. H. W. Dickow, president of the San Francisco Radio Club. The address and introduction was accomplished by radio telephone and loud speaker from the California Theater.

Mr. Dickow then addressed the convention, on behalf of the San Francisco Radio Club, and welcomed all the delegates and visitors, and closed by introducing Mr. Lufkin, chairman of the convention committee.

Mr. Lufkin outlined the entire plans for the convention, welcomed the attending radio men, and turned the convention over to Major J. F. Dillon, United States radio inspector, and who was the honorary chairman of the convention.

Mr. Dillon gave a brilliant talk on the possibilities of the convention, especially in the way of opposing bad legislation on controlling radio transmission, and gave a very comprehensive outline of the work done by the United States Department of Commerce for radio advancement. Mr. Dillon then concluded with words of praise for those who made the convention possible. His speech was met with the heartiest applause of the day.

The honorary chairman then called for

a report from the credentials committee to find which organizations were entitled to seats in the convention. Chairman Tinsley, Mr. D. B. McGown and Mr. L. E. Grogan of this committee reported that all radio clubs should be seated that presented credentials. Seventeen radio clubs were officially seated. The committee refused seats for the Pacific Radio Supplies Company, "Pacific Radio News" and the Leo J. Meyberg Company for the reason that no sales or commercial organization should be entitled to a vote. A harsh protest was voiced to this statement. A vote was taken and popular sentiment showed that every willingness was evident to permit manufacturers of amateur apparatus, and especially the "Pacific Radio News," to have seats in the convention. The "Pacific Radio News" was lauded and declared to be the greatest medium of the West and entitled to a seat, even though manufacturers were barred. A great applause met this statement. An official amendment was then made to the report of the credentials committee by Mr. Tinsley, and "Pacific Radio News," Leo J. Meyberg Company, and the Pacific Radio Supplies Company were given seats, with six votes to each.

The credentials committee then reported that all recognized organizations were to be given six votes each.

The honorary chairman, Mr. Dillon, then introduced the following men, who gave talks on the convention and other topics of interest: Mr. C. I. Hoppough, radio engineer for the Signal Corps, U. S. Army; Mr. B. Wolf, Pacific Coast radio supervisor for the United States

Shipping Board; Mr. C. Langevin, Pacific Coast representative for the United Radio Telegraphers' Association; Mr. L. Malarin, of the Radio Corporation of America; Mr. Leo J. Meyberg, of the Leo J. Meyberg Company; Mr. Colin B. Kennedy, of the Colin B. Kennedy Company; Mr. A. E. Bessey, one of California's most prominent and enthusiastic amateurs; Mr. Pray, of the North Dakota Radio Association; Mr. Blake, of the Federal Telegraph Company; Mr. Kuhn of the Ship Owners' Radio Service; Lieutenant Twist, of the Naval Radio Service, and many other prominent radio men.

The next transaction of the convention was the nomination and election of a resolutions committee. Mr. H. W. Dickow was elected as chairman of this committee, and the chairman of each delegation was appointed as one of the resolutions committee. A recess of twenty minutes was called by the honorary chairman to allow the resolutions committee to transact its business.

Following the recess, Sergeant Lufkin read a telegram from the National Radio School of Washington, D. C., wishing the convention success.

Chairman Dillon then called for a report of the resolutions committee. Chairman Dickow of this committee read the resolutions. The first resolution was to make the radio convention an annual affair. Another resolution was introduced to appoint a chairman for the next year's convention, a man who is not affiliated with any commercial enterprise in the radio field. Nominations were: Major Dillon, Mr. Linden and Mr. McGown. Major Dillon was elected

580 Radio Men in Attendance

Twenty-six Organizations Given Six Votes Each.
Sixteen Radio Clubs Represented.



The foremost radio man and the humblest amateur were given equal voting power at the convention

by a tremendous majority and amidst a loud applause.

Mr. Dickow read a resolution, introduced by the Pacific Radio Publishing Company, to protest the passage of the new proposed radio act to regulate radio communication. The "Pacific Radio News" was the only publication which published the entire bill in its columns. A protest was drawn up and every attending radio man was asked to sign and the protest was to be sent to the Congressman from California. This resolution met with a roar of applause, and was unanimously accepted and members and friends signed the protest.

The third resolution was introduced by the Bay Counties Radio Club and read by the chairman of the resolutions committee, Mr. Dickow. This resolution called for a certain signal to be transmitted before beginning transmission in order to ascertain if other stations were listening for a message. This resolution met with a great deal of counter argument and the figure "4" was finally adopted by the delegates.

Another recess of twenty minutes was called. A photograph of all delegates to the convention was taken in front of the convention hall during this interim.

The next resolution was introduced by the San Francisco Radio Club, Inc., and was to form a committee of six to act as an advisory council to mediate, arbitrate and settle all questions relating to radio which would be brought to its attention. The council was to meet four times a year in San Francisco, Calif. The members of this council were named United States radio inspector for

the Sixth Radio District, Pacific Coast radio supervisor for the United States Shipping Board, United States district communication superintendent for the Pacific Coast Naval District, United States chief signal officer for the United States Army, Western Department, United Radio Telegraphers' Association representative for the Pacific Coast Division, and the chairman of the board of directors of the San Francisco Radio Club. The second part of the resolution called for the establishment of a Pacific Coast Radio League, with "Pacific Radio News" as official organ. There was a decided protest on the latter half of this part of the resolution and it was defeated two to one. The resolution was then passed with the amendment that the American Radio Relay League representative of the Pacific Coast District be appointed on the advisory council instead of the chairman of the board of directors of the S. F. R. C.

Mr. Dickow then praised Mr. Dillon, honorary chairman of the convention, on the excellent manner in which he carried on the convention, and thanked Sergeant Lufkin for the untiring efforts he made on the convention work. He then concluded with a wish that all delegates and visitors to the convention have a capital good time at the radio show, banquet and ball which was to follow.

Mr. Lufkin thanked the committees that worked for the good of the convention in behalf of all present.

Major Dillon then closed the convention with the statement that any small difficulty that might have arisen, or any

point not fully covered by this convention, was to be overlooked by those affected, and everyone left with a sense that the first Pacific Coast Radio Convention was a great success. Adjournment was at 2:30 p. m.

THE RADIO BALL

ART HICKMAN'S jazz music from the St. Francis Hotel was carried to the radio ball at the Century Club on November 27th and amplified by means of a DeForest receiving equipment and a magnavox.

The dancers were given a treat in the form of a distinctive radio program. Herewith is a list of the radio dances:

1. Oscillating Fox Trot.
2. Amplified One Step.
3. Atmospheric Waltz.
4. Static Fox Trot.
5. Modulation Waltz.
6. Radiation One Step.
7. Frequency Fox Trot.
8. Synchronous Waltz.
9. S. O. S. Fox Trot.
10. Conventional One Step.
11. Electron Fox Trot.
12. Quenched Gap Waltz.

EXTRAS

1. The Alternating Special.
2. The Ether Waltz.
3. Loose Coupled Waltz.

THE RADIO BANQUET

A SEVEN-COURSE chicken dinner greeted the anatomies of the visiting delegates to the convention. One hundred reservations were made and one hundred constitutions were replenished with sufficient food to hold them over for another year. Radio speeches and



The center of attraction at the wireless show was the U. S. Navy exhibit. A complete radio compass station of the latest type was in constant operation. By means of a radio telephone equipment of the type used on many vessels of the navy, constant telephonic communication was carried on with nearby stations. Other apparatus on display included the new Navy Standard short and long wave receivers, audion control panels, loud speakers, emergency transmitter and a set of storage batteries for driving the dynamotor that supplies current to the radio telephone set. The U. S. Navy exhibit occupied one-half of the stage in the convention hall, while the other half was devoted to the U. S. Army. Among the exhibits displayed by the army were the following: Field set for telegraphic and telephonic communication, standard army pack sets, vacuum tube equipment, and an interesting collection of photographs of army radio installations.

jokes were delivered by more than twenty of the diners. Major J. F. Dillon, Sergeant Willard E. Lufkin and Mr. Dwight E. Lyon were the honored guests of the affair. Mr. Lyon spoke on truthful and honest radio advertising in the radio publications and congratulated the manufacturers on the manner in which they are carrying on their work.

First grade amateur licenses were issued at the Radio Show of the convention by the radio inspector of the Sixth Radio District to the following:

Lew Torrey, 3820 High street, Oakland, Calif.
 Russell A. Hallon, 437 Walnut street, San Francisco.
 Ernest M. Carr, 316 Presidio avenue, San Francisco.
 John W. Barrett, 900 Jackson street, San Francisco.
 Arthur M. Herren, Eighth Service Company, Signal Corps, Presidio, San Francisco, Calif.
 Carl J. Penther, 1076 Aileen street, Oakland, Calif.
 Paul J. Wing, 1040 Fifty-sixth street, Oakland, Calif.
 Alfred G. Hibbard, 1701 Gough street, San Francisco, Calif.
 Sterling Winters, 659 Clayton street, San Francisco, Calif.
 Wm. W. Scamell, 1033 Excelsior avenue, Oakland, Calif.
 Arthur L. Bolton, Jr., 1700 La Loma

avenue, Berkeley, Calif.

Burton Cole, Los Gatos, Calif.
 Herbert C. Hand, Carmel, Cal.
 Chas. M. Dunn, 320-A Guerrero street, San Francisco, Calif.

RADIO organizations who were awarded six votes each by the credentials committee of the convention:

San Francisco Radio Club, Inc.
 Bay Counties Radio Club.
 Polytechnic Radio Club.
 Reno, Nevada, Radio Club.
 University of California Radio Club.
 North Dakota Radio Association.
 Santa Cruz Radio Club.
 Lowell High Radio Club.
 American Radio Relay League.
 Monterey Radio Association.
 Technical Radio Club, Oakland.
 Stockton Radio Club.
 Pomona Radio Association.
 Sacramento Radio Club.
 Napa Radio Club.
 Federated Malay States Government.
 Evening High School Radio Club of San Francisco.
 "Pacific Radio News."
 Leo J. Meyberg Company.
 The United States Army.
 The United States Navy.
 The United States Shipping Board.
 Department of Commerce.
 United Radio Telegraphers' Association.
 Knights of Columbus Radio Club.
 Pacific Radio Supplies Company.

Delegates from all of these organizations were present.

THE exhibit of the Colin B. Kennedy Company at the recent wireless show in San Francisco called forth much favorable comment from the visitors at the exposition, both on account of the attractiveness of the display and because of the high quality of the apparatus shown. Eastern visitors were heard to exclaim in surprise at the high standard exhibited by apparatus of Pacific Coast manufacture, and one remarked that nothing produced in the East could surpass the thorough-going, high quality, characterizing Kennedy receiving equipment. Westerners in general, and Californians in particular, may well be proud of possessing factories producing such apparatus.

The Colin B. Kennedy Company, whose exhibit is shown in the illustration above, was recently incorporated under the laws of the state of California after existing for some time as an individual enterprise. With its incorporation, the company acquired additional engineering personnel and manufacturing facilities. In the reorganization of the company, Colin B. Kennedy, founder of the original concern, was made president; Harry J. Rathbun, vice-president; Nathan A. Bowers, secretary, and Emile A. Portal, treasurer. These men, with Dr. Leonard F. Fuller, constitute the board of directors. Mr. Kennedy has

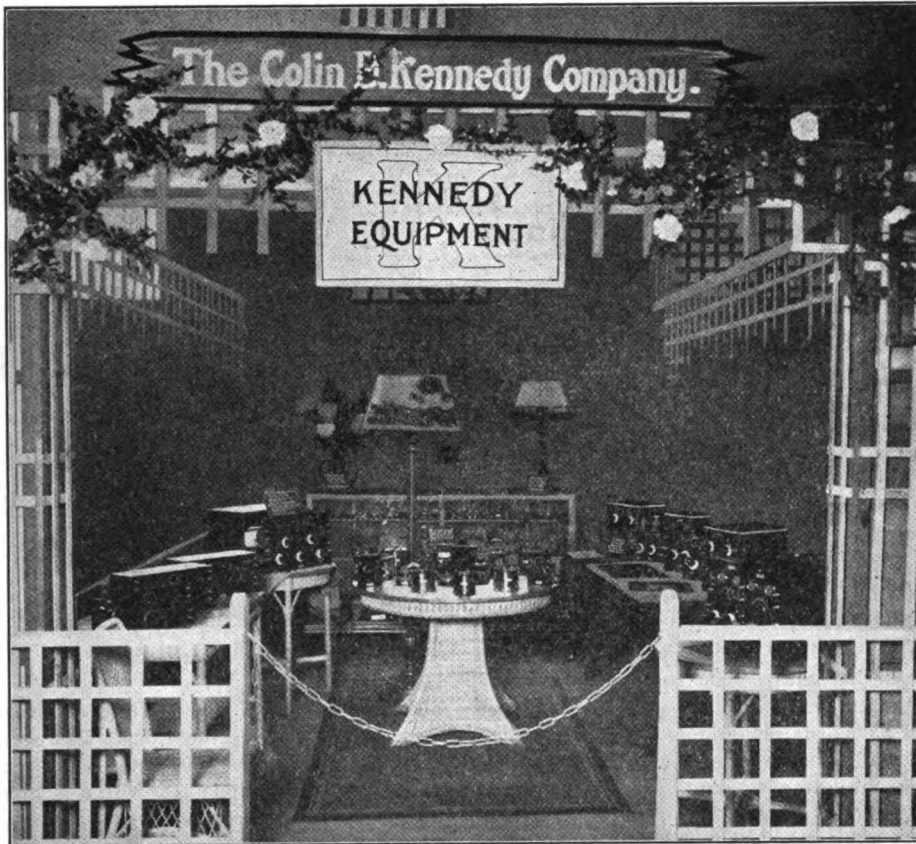
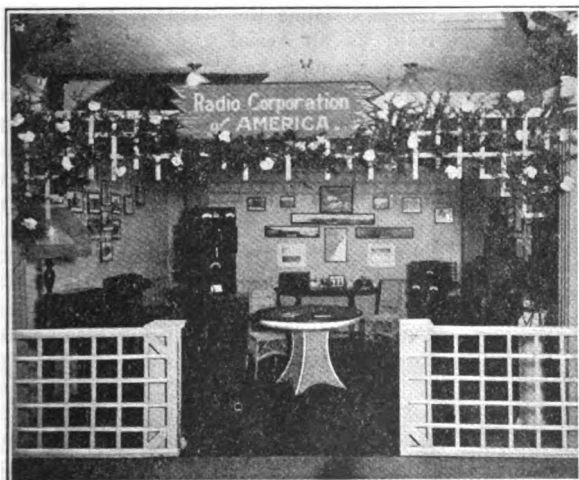


Exhibit of Colin B. Kennedy

spent most of his life in various phases of the art of communication, with the British Pacific Cable Company, the Canadian government radio service and the Federal Telegraph Company. Mr. Rathbun was also connected with the engineering department of the Federal Telegraph Company in various executive capacities for several years during the progress of the design and development of the equipment for the chain of high power transmitting stations for the U. S. Navy. Mr. Bowers has been for the past six years Pacific Coast editor of the McGraw-Hill technical publications. Mr. Portal joined the organization from the

research staff of the National Radio Company after serving in the naval radio service, following many years as an associate with Professor Charles D. Herrold in radio research. Dr. Fuller was Chief Electrical Engineer of the Federal Telegraph Company during the period, covered by the development of the modern Federal-Poulsen arc transmitters of both high and low power, ranging from two kilowatts to one thousand kilowatts. He is too well known the world over as a radio engineer to require further mention here.

The Colin B. Kennedy Company maintains its offices and display rooms in the Rialto Building, San Francisco.



Booth of the Radio Corporation of America

Herein was displayed not only the modern commercial installation, but also the apparatus used in the pioneer days of radio. An aeroplane equipment, manufactured by the Corporation, was another display of unusual interest.

AN OSCILLATING ODDITY The Answer to the Contest Held by the Pacific Radio Supplies Company at the Wireless Show

By B. F. McNamee, Research Engineer, Pacific Radio Supplies Company.

A curious oscillating valve circuit was shown in operation in the booth of the Pacific Radio Supplies Company at the San Francisco Wireless Show, and prizes were offered for the two best written explanations. Following are the winners:

Homer G. Tasker, 2015 Hearst avenue, Berkeley, Calif.

Earl R. Meissmer, 2329 Carlton street, Berkeley, Calif.

An Electron Relay was awarded as a prize to both of the winners.

For the benefit of those who did not have the good fortune to attend the show, the following account of the circuit and its action is given. The circuit used is shown in Fig. 1. C is a condenser of .1 mf. capacity. P and S are the primary and secondary respectively of an audio-frequency amplifying transformer. Although

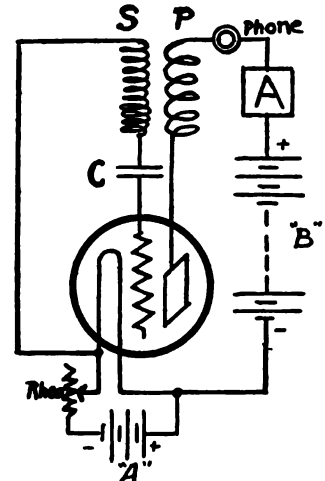


Fig. 1

the transformer used was of the air-core type, one with an iron core would do. The telephone receiver used was of the usual high-resistance type (about 1,000 ohms). The meter was a Paul Unipivot micrometer having a full scale reading of two-tenths of a milliampere. The circuit would, of course, operate without the meter and the telephone, both of which were used to indicate the action of the circuit. The valve was an AP amplifier, which has a very high vacuum. The "B" battery was about 60 volts, but might have been anything from 15 to 500 volts. The needle of the meter showed a gradual increase of plate current from nearly zero to about 60 microamperes, taking four or five seconds to do so. Then a very quick swing of the needle showed a sudden increase of plate current from about 60 to about 140 microamperes. This sudden increase was accompanied by a high-pitched note of short duration in the telephone. The needle swung back to zero just as

(Continued on page 180)

WORLD'S RECORD FOR FAST RADIO RECEPTION IS BROKEN AT THE CONVENTION

A. E. Gerhardt copies over forty-nine words per minute for a period of more than four minutes

M. L. HART, U. S. N., TAKES SECOND PLACE

THE world's record for fast reception of radio signals was broken by A. E. Gerhardt at the wireless show of the Pacific Coast Radio Convention on November 28, 1920. Gerhardt copied forty-nine and a quarter words per minute for four consecutive minutes, with but five errors. A Wheatstone transmitter was used for the contest and messages of ten words in length were sent.

Gerhardt is employed by the Radio Corporation of America at the high power station, Marshall, Calif.

He succeeded in winning second prize at the speed contest of the recent exposition in San Francisco, but he is now the uncrowned king of the radio code.

Major J. F. Dillon, local United States radio inspector, was the judge of the contest. The prize awarded to Mr. Gerhardt was a silvered electric shaving mirror.

M. L. Hart, chief electrician, radio, U. S. N., won favorable mention by maintaining the same speed, but not with the same accuracy.

Gerhardt also won first place in copying ten letter code messages at a speed of 33 words per minute.

An amateur speed contest was held on the same evening.

Perfect copy at a speed of 25 words per minute was handed to the judge of the contest by M. S. Ayres of San Francisco. He was awarded a pair of 2,200



"Tony" Gerhardt

ohm receiver as a prize. The receivers were donated by the local DeForest Company. Mr. P. Friedental took second prize. He copied 25 words a minute with but three errors. He was awarded a Radio Shop variometer, donated by the Radio Shop of San Jose, Calif.

LATEST IN RADIO AUTOMOBILES



Fred W. Swain and Wilbur Cramer are credited with this unique auto equipment. The center photo shows the elaborate receiving set being operated by Wilbur Cramer.

WHEN Wilbur R. Cramer and Fred W. Swain, 2916 North Sixteenth street, Omaha, Neb., take their evening ride in their automobile they can chat with their friends by wireless telephone. The equipment shown in the accompanying photographs is the apparatus with which they have been experimenting for the last several years. It is attached to their automobile, as shown, and can be operated while traveling.

Their experiments with amateur wireless telegraphy began four years ago while they were attending the Omaha

High School. Following the completion of their courses, both men continued their intensive study and have several inventions already in operation.

Another channel for their wireless efforts will be the conveying of orchestra music from one Omaha motion picture theater to another, and the transmission of a speech from a nationally known suffrage worker while in Chicago to one of these theaters in Omaha.

The Pathe News Service, Kinograms, and Selznick News have taken about two hundred feet of motion pictures of their apparatus while in operation.

HOW WOULD YOU LIKE AN OLD-TIME RELAY BY 9XE?

MR. W. KIRWAN, sales manager of TRESKO, is arranging for an "old-time relay" by 9XE. He expects to get a message from President-elect Harding and deliver it to every state in the Union. It is his desire to have it delivered by amateur radio to Hawaii and Alaska. CW and phone sets will be a feature of the relay. Further details will be published in our next issue.

WHILE traveling by train from New York to Boston, one of the staff of the American Radio and Research Corporation enjoyed a novel experience with the use of an Amrad crystal detector. Using the baggage rack of the train as an aerial and the steam pipe for a ground, he was able to hear signals from stations many miles distant. An extensive line of new receiving apparatus is in the process of manufacture by the Amrad Corporation, of which the crystal detector referred to above is one unit.

Actions speak louder than words! Write a firm protest against the passage of S4038 to your Congressman before you lay this issue aside.

Hit the iron while it's hot. Fight for your rights as an amateur radio operator. Tell your Congressman to 'help' defeat Bill S4038.

Arc Radio Apparatus

By Jennings B. Dow

Published by Permission of the Secretary of the Navy

PART V.

CONTROL OF ARC OUTPUT

FOR telegraph work, the problem of controlling the output of the arc presents little difficulty and several methods are available. Fig. 11 shows one method in which a key is bridged across a few turns of inductance in the antenna circuit.

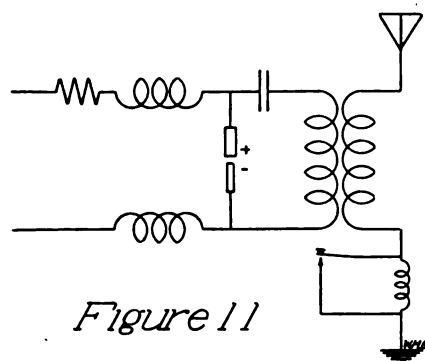
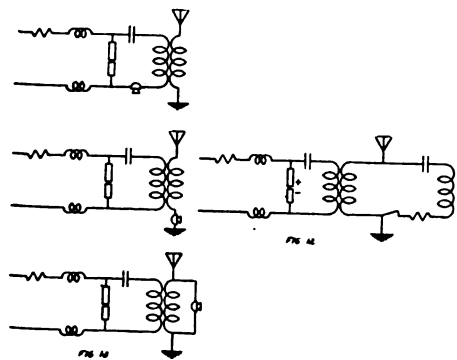


Figure 11

This is, without doubt, the most common method. If the antenna current is in excess of four amperes and this should be the case if the arc input is over 1 K. W., the key contacts will be subjected to considerable arcing. This difficulty may be eliminated by decreasing the amount of inductance bridged by the key contacts and, if necessary, by using a multiple key arrangement whereby one set of contacts is called upon to bridge only one or two turns of inductance. It will be seen that by using this method of control, two waves will be radiated. One of these waves cannot be read as the groups of oscillation will conform in duration of time



to the spaces in letters of the code. Fig. 12 shows the absorption method of control. A circuit, consisting of a resistance, inductance and capacity having practically the same constants as that portion of the antenna circuit not

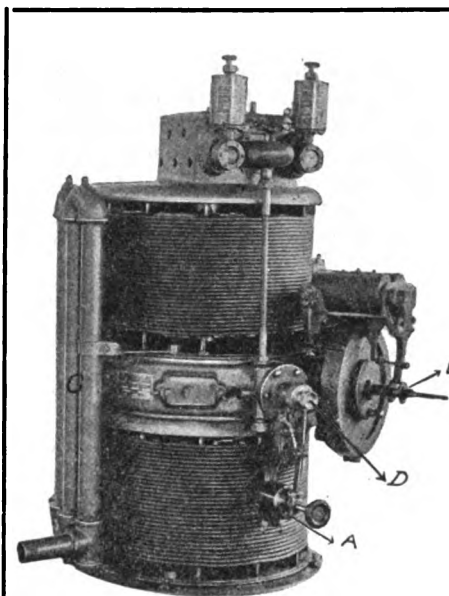


Fig. 2A

Description of Federal Telegraph Co. 5 K. W. Arc Converter, Fig. 2-A.

This converter is used in conjunction with the wave-changer shown in Fig. 4-A, and has many unique features which will be taken up in detail. The cathode is at "D", and the anode, which cannot be seen, is displaced 90 degrees. "A" is a small solenoid which facilitates remote control of the striking mechanism. "B" is a third electrode which is used for signalling in place of the relay keys

heretofore mentioned. Its action is briefly as follows: When no signalling is being done, the electrode is held in contact with the anode by means of a small tension spring. This electrode is connected to earth or what is the same thing, to the cathode, through a resistance of such value that when it is shunted across the arc no oscillations can take place, and signals are made by opening and closing this circuit by means of this key. This is done by energizing the solenoids above the electrode through a local circuit consisting of source of power and a small key. Another novel feature incorporated in this design is the use of a gas seal for the arc chamber "C" is essentially a long piece of pipe, one end of which is connected to the arc chamber and the other end to atmosphere. The total internal volume of this pipe is approximately equal to that of the chamber. When the arc is started, sufficient hydrocarbon is administered into the chamber to fill this pipe with gas as well as the chamber. In case the arc is extinguished for a time, and by virtue of the fall in temperature, the gas contracts, some of that contained in "C" is drawn back into the chamber. Owing to the fact that the chamber pressure is at all times equal to atmospheric pressure, there is little tendency for any air to enter it through leaks.

bridged by this circuit, is placed across the active coupled inductance of the antenna circuit. This circuit is intermittently opened and closed by a key which is preferably placed near the grounded side. When the key is closed, a large portion of the energy which is transferred from the arc is made to flow through the resistance in the dummy circuit where it is absorbed, and this results in a material decrease in the antenna energy.

In certain cases of smaller arcs under 1 K. W. input it will be found possible to control the antenna circuit by opening and closing the antenna circuit. It may be necessary when using this method to loosen the coupling between the open and closed oscillating circuits in order to prevent the effects of excessive reaction between the two circuits and possible extinction of the arc. The application of the arc to radio telephone work has always been a problem, and

up to the present time no really successful method of control has been devised. This lack of a successful modulator for the arc output is largely responsible for the undeveloped low power arc of today.

Microphones whose design vary from the ordinary telephone transmitter as used in wire telephony, to huge water cooled types have been used, and various departures from the ordinary carbon grain type have been made. Majorana used an electrolytic jet which was made to impinge upon two electrodes, and the variation in the physical condition of the jet caused by voice vibration altered the resistance across the path between the two electrodes, and consequently the amount of energy that would be passed. Fessenden varied a capacity shunt across a certain part of the oscillating circuit with some success.

(To be continued)



HELP!

By C. Hennings

I WAS tired. So tired that the last signals I had heard had come through the receivers with a dull and muffled sound, very different from the sharp and clear code I had copied earlier in the evening. I was glad that I could turn in, for now that the nightly press had been received, I had nothing else to do. The mate must have sensed something of my weariness when I whistled through the speaking tube that all was well.

"Pleasant dream, Sparks," he called to me.

I gathered up the sheets upon which I had been copying news, for even a radio station must have some order of neatness, and started to pull off my coat. One arm was out, and I was working with the other when I distinctly heard a call. I stood stock still.

"S. O. S. S. O. S."

I dropped my coat, papers went flying to all parts of the room, and with one jump I was in my chair before the tuner. There was no need, however, of putting the receivers over my ears, for the sounds had come in loud enough the first time to be heard without phones. I quickly adjusted them to my head in a sort of second-nature movement, and reached for a pencil with which to copy what I felt certain would follow. I heard nothing in the phones except a far distant vessel reporting her position. My two detector tubes were droning and hissing away in a regular duet, and I could hear the faint hum of the generator down below in the dynamo room. That was all. I had evidently made a mistake.

Once more I started for my bunk. The receivers were on the table while I began to gather up the press reports which had flown all over the floor. Then as I stooped under the table to get the last sheet, the call came again,

clear, distinct, in a peculiar whistling noise.

"S. O. S. S. O. S."

Once more the papers went to the floor. "Some foreign ship," I thought, for the signals were of a strange fluttering quality. The receivers were again dead. Nothing but the detector hiss came to my ears. Excitedly I tore off the receivers and blew through the speaking tube.

"Just heard an S. O. S. What'll I do?"

"That so," was the mate's rather disinterested reply. "Don't get excited. The ocean is a big place."

"Yes, but this is close. Hadn't we better call the Old Man?"

"Nope, can't bother him with such stuff. Find out where the old tub is that wants help," And with that he hung up his end of the tube.

I was quite angry at the Mate. He was a young fellow, a former naval radio operator, and should have known the seriousness of the distress signal. I jumped to the end of the cabin and peered out of the porthole into the blackness of a murky St. Lawrence night. Before my eyes could become accustomed to the darkness outside, the signal came again.

"S. O. S. S. O. S."

"I just heard it again," I shouted to the Third Officer. "It's a ship in trouble. Pretty close, too. See anything?"

"Nope," was his only reply. I heard the AB at the wheel laugh as I dropped my end of the speaking tube. It jarred on my nerves to have the Mate and the wheelsman joking when a ship was in trouble so near.

Only silence greeted me when I placed the phones over my ears again. Touching the button at my elbow, I waited until the rising whine of the motor-generator told me that the "juice" was ready, and then my own clear spark sung out into the night.

"Who sent out S. O. S.? Where are you? What's the trouble?"

No one answered. At least no ship answered, but in a few seconds Grindstone Island came back in his sharp staccato notes.

"Who heard S. O. S.? Who are you? Where are you?"

As well as I could I told him our position. He then called North Sydney and Point Riche, but neither of them had heard the call. I could not understand it, for the signals had been quite loud. I pinched myself to make certain that I had not been dreaming.

"Your mistake," said Grindstone Island rather caustically, and I was about to reply when a long whistle on the speaking tube stopped me.

"Anything doin', Sparks?" queried the Mate.

"Nothing new," I said.

"Well, listen real hard now," and once more I heard the Quartermaster and the Mate laugh. Then quite distinctly came the call:

"S. O. S. S. O. S."

I drew back to the opposite wall, my heart threatening to upset in surprise. Then from my wall chest I grabbed a can of face powder and again called the pilot house.

"It's very plain now, Mate," I said. "Do you want to hear it?" and when his affirmative reply came down that long winding copper tubing, I filled my end with powder and gave a long lusty blow. Expectantly I waited. I distinctly heard the A. B. wheelsman laugh again, this time with more life than before, and in a second the Mate roared down:

"You win, Sparks, she's sunk!"

RADIO ENGINEER WILL PRESIDE OVER BAY COUNTIES RADIO CLUB

MR. B. F. McNAMEE, research engineer of the Pacific Radio Supplies Company, was elected to the presidential chair of the Bay Counties Radio Club at the regular election of officers held in the club rooms on December 3rd.

Mr. G. V. Tudhope, former president, is now first vice-president; C. H. Grubbs, in charge of the local DeForest factory, is second vice-president, and Stanley Hudd is third vice-president.

R. W. Carroll will remain in office as recording secretary and W. D. Wood will act as financial secretary.

C. T. Peterson was elected treasurer; S. Sollie is the new sergeant-at-arms, and R. H. Cornell, Jr., is the new chief operator.

The board of trustees has for its new members Mr. B. F. McNamee, Mr. G. V. Tudhope and Mr. R. C. Adams.

The speaker of the evening was Mr. M. E. Borch of the Reliance Radio Laboratories. His lecture dealt chiefly with the decrement question of 200-meter transmitters.

Meetings are held on Friday of every week in the new club rooms of the Alden Branch Library, Fifty-second street and Telegraph avenue, Oakland. A radio telephone and spark station will soon be ready for installation. The club has a membership of 140.

THE HAWAIIAN TRANSMITTING TEST

MUCH to the regret of fifteen Pacific Coast amateurs, the Hawaiian transmitting test did not accomplish its object. However, the contestants can feel much encouraged to hear that practically all stations were heard by the operator on the Matson liner "Maui," 1,800 miles from San Francisco, 300 miles from Honolulu. Further encouragement is had in the form of a letter received from a Honolulu amateur who states that he heard a CW station working on a low wavelength at the time that the test was scheduled to take place. The station heard by the Honolulu amateur was probably 6ZE, Mr. D. B. McGown, 1247 Forty-seventh avenue, San Francisco, who was using a CW transmitter on a wavelength somewhat above 200 meters. No stations were heard either by Mr. Mulrony at Pearl Harbor or by Mr. Hall at Honolulu. The following letters will explain more fully the results of the tests. Mr. Mulrony suggests that another test be held in June, 1921, as the present receiving season in Honolulu is an exceptionally poor one. In view of the fact that Mr. McGown's CW set may have been heard by the Honolulu amateur station, we will arrange an individual test for CW equipments and will be pleased to accept applications for another test from amateurs who desire to participate. In the meantime we will arrange further details for our next issue. We publish herewith a letter received from Mr. Kenneth A. Cantin of Honolulu and three letters received from Mr. Mulrony:

Honolulu, T. H.,
November 30, 1920.

Paul R. Fenner,
Editor, Pacific Radio News,
San Francisco, Calif.

Dear Sir:

Kindly send me the transmitting schedule of the amateur stations that entered the trans-Pacific radio test of November 20th and 21st.

On the first night of the test, Saturday, November 20th, I was "listening in" for the coast amateurs, and between 12:10 o'clock and 12:15 I heard a CW undamped wave station working. Not knowing that CW undamped stations were to be used in the test until I received my "Pacific Radio News" a week after the test, giving the list and telling that two CW stations had entered, I tuned out this undamped wave station, as I thought that it would "Q-R-M" the coast amateurs that were transmitting.

I do not wish to claim that I received a coast undamped wave amateur station, but I would like to check over the transmitting schedule of the stations that entered the test so as to see if a CW sta-

tion was transmitting at the time I received these undamped wave signals.

Thanking you for a reply, I remain,
Yours very truly,
Kenneth A. Cantin.

6-T-Q.
Kenneth A. Cantin,
1593 Piikoi Street,
Honolulu, T. H.

U. S. Naval Station, Hawaii.
Pearl Harbor, T. H.
Office of Radio Officer.
November 10, 1920.

Dear Dickow:

Enclosed please find clipping from yesterday's paper. I have a lot of interest worked up here and all stations have agreed to close transmitters. Ten amateurs have already entered today, and the thing bids fair to go well. Give this test some publicity in San Francisco. I would suggest you fellows appoint a committee to take the 10 word official message in a sealed envelope to each of the six stations, the envelopes only to be opened a few minutes before the test—you see this will eliminate any faking, and I am only taking an interest in this because I expect the test to go on the square. Two of the amateurs here have first-class short wave receivers and excellent two-step amplifiers. I understand Mr. Hall has an eight-step amplifier, consequently there is good reason to believe signals will be heard. I will use a three-step amplifier and will only report what I hear in case no one else hears the messages and I do. I am appointing two observers here so that anything we report hearing will be absolutely square.

If we hear anything I will give the papers a good line of dope on you here.
Yours sincerely,
MULRONY.

U. S. Naval Station, Hawaii.
Pearl Harbor, T. H.
Office of Radio Officer.
November 7, 1920.

Mr. H. W. Dickow,
Pacific Radio News,
No. 50 Main Street,
San Francisco, Calif.

Dear Dickow:

Regarding the trans-Pacific amateur test, I have taken up the matter of closing down all transmitters on this island with the Navy through official channels and the request has been granted. The test to take place on November 20th, and 21st, 1920, beginning at 12:01 a. m., Honolulu time and to last twenty minutes each night.

The Radio Corporation and Mutual Telephone Company have also been requested to close down their stations and I expect they will reply favorably this week.

Eleven local amateurs have already entered their request to try to receive the

California amateurs' signals on this test, and I believe there will be at least twenty ready for the start, as we will give this matter considerable newspaper publicity in a few days. There are several very good amateur receiving stations on this island and I have good reasons to believe the test will be successful if all local interference can be made quiet during the test schedules.

I would suggest that you form a committee to select your six best radio transmitters on 200 meters and have these stations send in turn. The first night have No. 1 station start and send a ten-word message, beginning with his call about ten times, then send his message, repeating each word (double) and then finish his schedule with his call letter several times. Each sender to have a seven-minute period, at about ten words per minute, and be sure you have the time of the test correct. With this scheme it will give the local boys here a good chance to copy all that is sent and have the real proof of the test.

I am very much pleased with the interest which is manifested here and trust that everything will go well with the test.

Any messages which are copied as proof of the test will be repeated by Navy Radio Long Waves to San Francisco if the District Communication Superintendent will grant us permission to use this means to inform you.

Yours truly,
M. A. MULRONY.
Pearl Harbor,
November 22, 1920.

Dear Dickow:

Re the test on November 20th-21st, all amateurs were on the job and tried hard, but it appears no one heard anything on 200 meters. I saw Mr. Hall this morning and he says he did not hear anything, so it must be so. I listened in with four-step amplifier and heard nothing except very bad static on 200 meters. Tell the amateurs not to be discouraged, but to try again about next June—the present is about our poorest receiving time from the coast. With kind regards,

M. A. MULRONY.

343 So. Fremont Ave.,
Los Angeles, Calif.,
November 23, 1920.

Editor, Pacific Radio News,
San Francisco, Calif.

Dear Sir:

Thinking it may be of interest to the readers of your magazine, we are giving a few accounts on audibility of stations near San Francisco, as received at our station on the morning of the 21st and 22nd of November, using two stages of amplification (audiotron detector and Western Electric VT-1's) short wave regenerative set of the variometer type and two pairs of "Baldy's."

(Continued on page 185)

DOWN TO THE
MINUTE

Current Radio News

UP TO THE
STANDARDWORLD RULE, PLAN FOR
CABLES AND RADIO

Washington, Dec. 8.—(By Universal Service.)—The establishment of a universal electrical communications union, which it is hoped to model ultimately after the International Postal Union, having as its object the international reciprocal exchange of telegraphic, cable and radio communications, will be recommended by the International Communications Congress.

A preliminary report giving an outline of the arrangement it expected to perfect was made public by a special committee including delegates from the United States, Great Britain, France and Japan.

For guidance and control of the proposed union the congress makes provision for an electrical communications council, consisting of representatives of the United States, Great Britain, Japan and France and four representatives to be selected by the other powers.

In countries like the United States, where communication facilities are provided wholly or in part by private corporations, such enterprises when complying with international regulations in the treatment of international traffic, are authorized to exchange such traffic with all government-owned services. — San Francisco "Examiner."

NEW RADIO SITE SELECTED AT
BULL HARBOR, B. C.

VICTORIA, B. C., Friday, Nov. 26.—A site for a new wireless station to replace that on Triangle Island, which is to be dismantled early next year, has been chosen at Bull Harbor, Hope Island, near Shussartie, off the north end of Vancouver Island. The new station will be of similar power to that now at Triangle, and will handle traffic from ships and northern stations. The Ikeda station, which was closed some time ago, has been dismantled.—Seattle "Times."

RADIO ENGINEERS
VIEW PHONE EXCHANGE

THE San Francisco Section of the Institute Radio Engineers met recently in the telephone exchange at 445 Bush street, where the telephone system, together with the vacuum tube apparatus, was explained by A. G. Champereux, transmission engineer of the Pacific Telephone and Telegraph Company.—San Francisco "Examiner."

LONG DISTANCE DAYLIGHT COM-
MUNICATION RECORD BROKEN

H. A. Cookson, radio operator of the S. S. "West Camargo," establishes communication with navy stations at a distance of 1,200 miles from San Francisco.

What is believed to be a record for long distance work during the daylight hours has just been brought to light with the arrival here of the Shipping Board steamer "West Camargo." The operator of the vessel reports that he established communication with the NPW (Eureka, Calif.) navy station at a distance of 1,200 miles west of San Francisco during bright daylight. The following extracts from his log are of interest:

Worked NPW on 600 meter 2 k. w. quenched spark set at 1:30 p. m., a distance of 1,200 miles west of San Francisco. November 24, 1920.

Worked NPM (Honolulu) 900 miles in day time.

Copied NPK (Point Arguello) 600 meter spark in Wellington, New Zealand, at night.

Copied NPM 600 meter spark and KHK 600 meter spark in Melbourne, Australia, at night.

WIRELESS ON TRUCKS

SHANGHAI, Oct. 15.—(By Mail.)—Trucks of the Shanghai Fire Department are soon to be equipped with wireless telephones, conforming to the latest practices of the largest cities. The improvement is expected to enable the department at all times to keep in touch with its men while fighting fires.—Tacoma "Tribune."

FEDERAL TELEGRAPH NOTES

THE Federal Telegraph Company's application for authority to issue \$500,000 first mortgage 8 per cent serial gold notes was approved by the Railroad Commission on November 24th. The proceeds are to defray the cost of constructing four wireless stations on this coast, one at Palo Alto, one near Portland, Ore., one near San Diego and one near Los Angeles.

Construction of these stations has been made necessary by the termination of an agreement with the Pacific Telephone and Telegraph Company under which the latter company transmitted messages received by the Federal at the wireless plants, but which it could not forward because of lack of facilities.

Completion of the wireless plants at the various points named will enable the Federal company to give full service.—San Francisco "Chronicle."

PRESIDENT-ELECT HARDING
SENDS CONGRATULATIONS
BY RADIO

WHEN President-elect Harding sent his congratulations by radio to the American Society of Mechanical Engineers on their Fortieth Anniversary at Boston the increasing importance of wireless as a means of practical communication was forcibly brought home to all the mechanical engineers of the country.

Senator Harding's message, requesting the co-operation of the membership was broadcasted three times during the evening of November 5th by the station of the American Radio and Research Corporation who received the greetings from Marion, Ohio transmitting them to the Convention at Boston. Amateurs humbly.

Governor Coolidge, vice-president-elect also sent greetings by radio. Other messages received and sent by the Amrad Station were those of Mayor Peters of Boston, Dean Anthony of Tuft's College and H. J. Power, General Manager of the American Radio and Research Corporation.

Outside of the novel manner in which the president-elect sent his message to the Convention, its content is of deep significance to the engineering fraternity. Said he, "My greetings and good wishes to the American Society of Mechanical Engineers, on the occasion of the celebration of the fortieth anniversary of the organization. The Administration which comes into power next March fourth very much wishes the advice and co-operation of the membership. Signed: Warren G. Harding."

WESTPORT RADIO TO OPERATE
SOON

Construction work on the new naval radio station at Westport is progressing nicely, and the station is expected to be in full operation in another month, according to Chief Petty Officer James E. Parrott, in command of the new station.

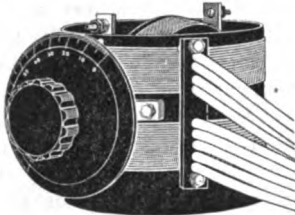
The new radio station will be one of the largest on the Pacific Coast, and is planned to have a sending radius of 1,000 miles, and a receiving capacity of a greater distance. Radio equipment of the latest type is being installed. When in full operation the new station will have a crew of about twelve men.—"Washingtonian."

Your Congressman will stand behind you in your endeavor to crush Bill S4038. If you don't write and tell him to protest its passage he may be in doubt as to how to vote on the bill.

WITH THE MANUFACTURERS

NEW KENNEDY VARIOCOUPLER

THE Colin B. Kennedy Company of San Francisco has brought out a new variocoupler designed primarily for short wave work. This unit is unique in that it affords a wider range of coupling between primary and secondary than is common in apparatus of this type.



The secondary is wound upon a well-seasoned hardwood rotor treated with a special high grade insulating filler to exclude moisture and to preserve and enhance the insulating qualities of the wood. It is mounted centrally within the stationary or primary winding which is wound on a vulcanized fibre tube of very high mechanical and electrical strength. The primary is provided with nine leads constituting a terminal and eight taps.

A small brass casting, through which the shaft passes, is provided to permit rigid panel mounting by the use of only two machine screws. This arrangement affords the obviously desirable feature of supporting the unit and passing the shaft through the panel at points close together.

The general arrangement results in a very simple, rugged and convenient piece of apparatus which is in full keeping with the variometers turned out by the same firm.

THE TRESKO Laboratory has recently added a number of new instruments to its well known line. The latest addition is the Wonder Tuner for 200 meter work. It is of the same size as the style DS tuner, but all tuning is done on a 21 plate variable condenser. When used in conjunction with an audion detector it brings in all the 200 meter stations with surprising audibility. It consists of a conductively wound helix of copper strip and a variable condenser connected in series with the aerial.

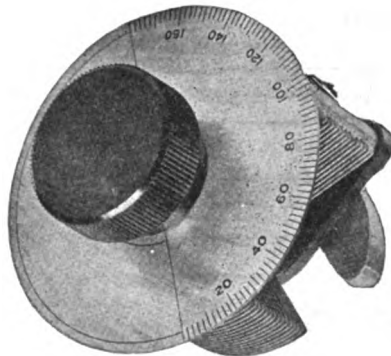
MR. H. MALARIN, formerly radio inspector for the Radio Corporation of America, is now sales manager of the Radio Telephone Shop of San Francisco.

THE SORALA TYPE CSU VARIABLE CONDENSER

ONE of the new variable condensers is the type CSU, made by the Somerville Radio Laboratory. While it is a condenser of comparatively low price, it combines the best features of the best make, and several new ones as well.

Practically everyone is familiar with Chelsea die-cast plate assembly. The CSU is of this type, and moulded Bakelite end-plates of the same manufacture are used to insure extreme ruggedness, best insulation and minimum leakage.

The shaft is of steel, five-sixteenths inch in diameter, running in bronze bearings. At one end a counter-balance is attached which assures permanence of scale position. As a further guarantee against shifting of scale position, a tension adjusting screw is placed on the back end-plate, which, with the broad rear bearing, makes the rotary plate action as stiff as the user desires.



A feature which appeals to many radio men is the ease with which the condenser unit may be mounted on a panel. The black oxidized brass mounting screws and nuts which are supplied also appeal to the more particular radio men, blending harmoniously with the usual grained Bakelite instrument panel.

However, the main feature of this condenser is the dial indicator. Formerly, dials were made of turned Bakelite or moulded composition, with the exception of a few others of white celluloid. While the Bakelite dials present a good appearance and do not warp, they are non-metallic and cannot be used to shield the circuit from capacity effects from the body, and are not adapted to direct calibration, as is possible with the CSU dial. The CSU dial has a COUNTER clock-wise scale which permits a capacity increase by rotation to the RIGHT. The fact that the navy uses this same dial design proves its worth. The dial is SILVER plated and then lacquered to preserve its finish.

Another feature is the generous two-

inch knob, also used on some navy apparatus and on Grebe receivers. Anyone who has tried to tune in CW with a small one-inch knob on the condenser will readily appreciate this "man's size" style.

AS we go to press we learn that Mr. Hall Berringer (6BJ) is now connected with the Radio Shop of San Jose, Calif., in the capacity of sales manager. Mr. Berringer made many new friends at the radio show of the convention, where he was demonstrating the new Radio Shop products.

WE welcome into the field the National Association of Radio Dealers. This new association is yet in its infancy, but is deserving of the support of every radio dealer. The temporary national headquarters are in Omaha, Neb., with Mr. F. Wilson Swain as acting secretary. The purpose of the association is to promote the greatest possible cooperation between the radio dealers, to exchange information and render service beneficial to its members, and aid in the maximum development of the radio industry.

Any person, firm or corporation engaged in the development, manufacture or sale of radio apparatus is eligible to membership.

An official bulletin known as the "N. A. R. D. News" is to be published monthly for distribution among the members of the association.

THE Somerville Radio Laboratories will market a new motor generator for radio purposes. It will be of the single housing, common shaft type with ball bearings. The new Somerville condenser and dial is shown in the accompanying cut. The dial is silver-plated and is six inches in diameter. The condenser unit is of the Chelsea Radio manufacture with a shaft of the correct size to accommodate the new dial and knob.

The Trans-Pacific Radio Operator's Log. A 32-page 5x7 pamphlet, issued on November 1, 1920, for the use of commercial operators employed aboard ships on the Pacific Coast. Contains much valuable information on Japanese radio stations, Oriental radio schedules, data on all naval stations, Japanese weather code signals, Golden Gate compass stations, wave-length abbreviations, and other general information on radio conditions in the Occident and Orient. The authors of the pamphlet are W. Breniman and G. E. Knudsen, pioneer commercial operators of the Pacific Coast.

FRESNO AMATEUR WORKS 150 MILES ON INDOOR AERIAL

Fresno, Calif.,
November 28, 1926.

Mr. Paul R. Fenner,
Editor, Pacific Radio News,
50 Main Street,
San Francisco, Calif.

Dear Friend Fenner:

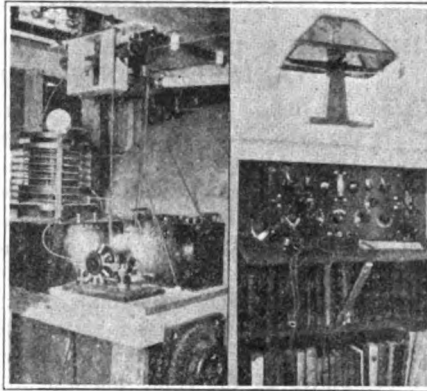
I am enclosing herewith photos and wiring diagram of my new radio installation, with description of same. I consider this installation as a whole something unique, and heretofore untried in its entirety.

You will probably remember that last winter I had my apparatus installed in the Fresno High School, where, operating on a 95-foot fan aerial, my signals were copied 1,600 miles over land, and practically the same distance out to sea. I carried on some relay work, actually exchanging messages with amateur stations up to 1,000 miles distant. This was done on $\frac{3}{4}$ k. w. input, and the transmitting range, I believe, was largely due to the high aerial.

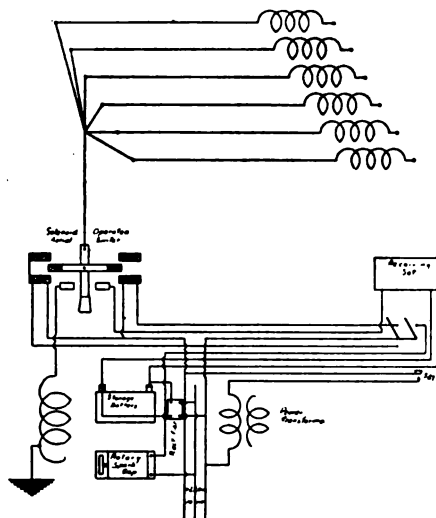
After February my call was no longer heard, as sickness in my family prevented my being away from home late at night. Not wishing to give up the game entirely, I decided to move the apparatus to my home, for the next season's work, so during the summer the set at the school was dismantled.

I then designed and built a modern regenerative receiving set with two steps of amplification, to fit into a built-in bookcase in the living room of our bungalow. It is comprised of the standard fittings and instruments found in most modern sets, the cabinet being 10x20x6 inches, made of mahogany, and nicely finished. The whole set complete with phones, tubes and B-batteries costing just about \$85.

Having no room in the house for the transmitting set, I decided on a remote controlled installation, so put the more or less dangerous and noisy thing in a small cellar under the rear of the house. This set consists of some standard apparatus, and some built by myself. The transformer is a Westinghouse type SK 1 k. w. 220 to 6,600 volts; the spark gap is the larger 12 stud Murdock rotary, which runs about 6,000 R. P. M. It is my intention to inclose the rotor in a cast metal case, similar to the Benwood, as soon as I can get time to make the patterns. The condenser and oscillation transformer were made by myself, being used in the former installation. The condenser is about .01-MF capacity, being built in two sections which are operated in series. Ordinary double strength window glass was used, and covered with tinfoil, the whole be-



ing immersed in transformer oil. A variable reactance is used in the primary circuit, which circuit is carried to the receiving set, and broken with a large Boston key. The set was tuned by means of a wavemeter, and only one turn is used in the primary coil of the oscillation transformer, while seven turns were necessary in the secondary. The input as measured with a wattmeter is 620 watts with a power factor of 0.85, resulting in a radiation of 3 amperes.



Wiring Diagram of Mr. Denny's Station

All operating and control wires run from the cellar to the receiving set through a galvanized iron conduit, including the aerial receiving lead, and this conduit is used as a receiving ground, being connected to the water pipes. The aerial switch, a solenoid operated affair, was also built by myself and is proving entirely satisfactory. The A-battery, an Exide 6 volt, is kept in the cellar also, for lack of other space, and is charged by a standard type of vibrating rectifier which "floats" the battery at a $\frac{1}{2}$ ampere charge continuously.

Having little or no room in the backyard for an aerial mast, due to a maze

of electric light and telephone services, and not wishing to decorate the roof of the bungalow with an unsightly aerial, I decided to put it out of sight in the attic. Realizing that I would not get nearly the required natural wave length in the 40-foot stretch, I wound up inductance coils of a large diameter, each containing 40 feet of wire. The wire used was No. 18 soft drawn bare copper, and six of them were stretched the length of the attic, 3 feet apart, with one of the inductance coils added at the free end of each wire. The aerial was supported from porcelain cleats, and had an average height of 15 feet from the ground. Besides adding to the natural wave length, these coils increased the electrostatic capacity of the aerial system. The lead-in is a length of Packard high tension automobile cable connected to all the wires at one end and passes down between the walls to the aerial switch in the cellar below, the whole installation being entirely concealed and exceedingly well insulated.

My transmitting has been limited to just a few nights, having only recently received my station license, corrected to cover the present installation. I have, however, been heard up to 150 miles, and that distance QSA, so no doubt have a range of several hundred miles. For receiving, the aerial is quite as good as a higher one outdoors. The following stations have been heard in a single week:

6AB, 6AD, 6AF, 6AT, 6AAW, 6ABP, 6BC, 6BJ, 6CY, 6EJ, 6EN, 6ER, 6EZ, 6GF, 6HV, 6IG, 6IL, 6JD, 6JI, 6JM, 6JN, 6KP, 6KX, 6OH, 6OX, 6RJ, 6SK, 6XZ, 6ZA, 6ZH.

I should like to request that from now on all stations hearing 6CS will QSL either by radio or mail, or both, so that the maximum transmitting range of this type of station may be determined.

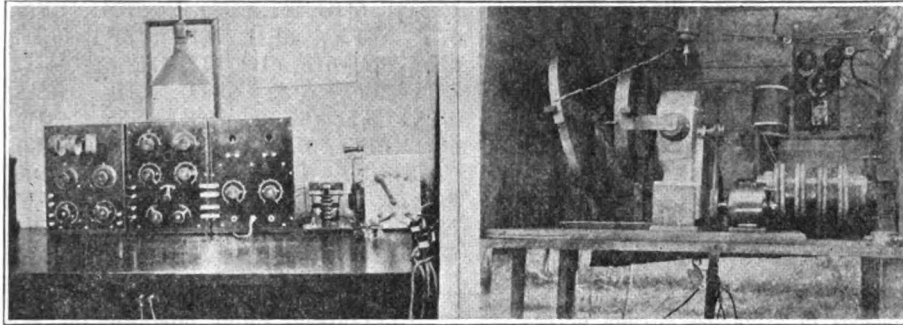
Mr. Fenner, if you care to work up the information in this letter into an article for publication in your "Pacific Radio News" you are certainly welcome to it. I think it would open up opportunities to many members who have heretofore considered operation under such conditions impossible. Some may ask about inductive interference to the parallel lighting circuits in the attic. I shot out several sockets on the start, but after insulating them at their inherent weak points with mica, had no further trouble. Neither am I bothered by induction from these circuits when receiving. Fact is, I get more QRM from my five months' old son than anything else, providing that my two-year-old daughter is in bed.

Signed: R. C. Denny.

"6EN"

HERE is another of our Pacific Coast relay stations. 6EN is its call, and it is operated by Messrs. H. A. Duvall and C. G. Esler. One of the operators is on the job every night. Duval signs HD and Esler signs RX. The station is located in Los Angeles, Calif., and is

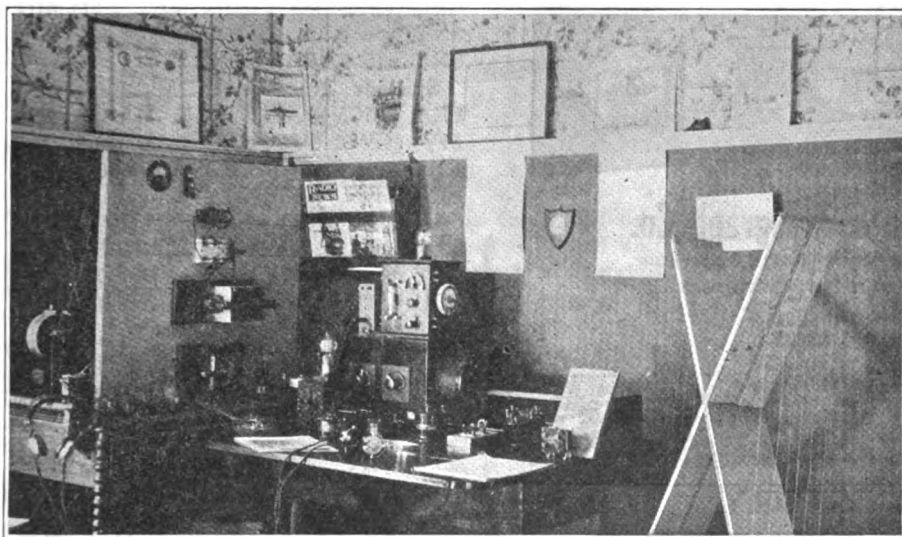
some time. For the ground connection a number of galvanized pipes driven into the earth are used, as well as two large sheets of galvanized iron and a mass of wires running to many water pipes in the vicinity. The receiving set is home-made throughout. A honeycomb coil



well known among the Western amateurs. The transmitter is arranged in a large box and is located in the yard of the station's owner. A home-made 1 k. w. transformer with the secondary wound over the primary on both cores is used for transmitting. The condenser is of the glass plate, oil immersed, type A Benwood gap and a home-made oscillation transformer complete the equipment. The primary of the oscillation transformer consists of one-half turn of $1\frac{1}{4} \times \frac{1}{8}$ inch ribbon, and trouble from heating this of this ribbon is experienced after the set has been worked for

set is used for long wave reception. With the use of one bulb and this set, signals from NSS have been copied with ease. The French station (YN) has also been heard several times. A short wave regenerative receiver and two-step amplifier are used for amateur wavelengths. The receiver is of the tickler coil type and is extremely sensitive. Signals of high amplification are received without distortion of signal note. The familiar "Baldy" phones are used and have been fitted with plugs so that changes to any stage of amplification may be made in the shortest possible time.

ONE DOUBLE YOU TEE



THE photo of station 1WT, located at Manchester, N. H., needs little explanation. The owner is Mr. Louis M. Higgins, 119 Myrtle street.

The receiving equipment consists of a Clapp Eastham tuner, Clapp Eastham

Radian tuner for navy working, and a Tresco long-wave receiver. The A. P. tubes are used for audion reception. Three condensers of variable capacity and two pair of phones complete the receiver.

The EDITOR'S MAIL BAG

Our Readers Are Invited to Send Contributions for Publication in this Department.

THE EDITOR'S MAIL BAG

San Jose, Calif., December 3, 1920.
Pacific Radio Publishing Co.,
50 Main St., San Francisco.

Gentlemen:

6BJ would like to state that he is now using 980 watts for his transformer primary input. The gentleman who calls himself Ten-nin-o in the December issue of "Pacific Radio News" is invited to take a trip to Burlingame any night or Sunday and bring his good watt meter with him to measure the primary input.

The station known as 6BJ has been remodeled during the past month. A rotary gap consisting of a 12-inch disc with 16 studs is driven by a $\frac{1}{4}$ H. P. motor at a speed of 3,400 R. P. M.

Your friend, Hall Berringer.

San Francisco, Calif., December 6, 1920.
Pacific Radio News,

San Francisco, Calif.

Dear Sirs:

Suppose you saw the little item in the "Examiner" about working the S. S. Columbia. I received a letter of commendation from the Navy Department for the good work, working her 4,000 miles out at 11:55 p. m., November 27th. They claim this is a record for the Beach Arc. I am not sure if Inglewood has worked any ship out that far before midnight. On December 1st I worked her out 5,100 miles. Her TR msg said 4,920, 8 p. m., but I did not work her until about 5 a. m., so she must have been about 5,100 by that time. This has been surpassed by the Inglewood station a few years ago. Think a number of records will be made this winter. Worked the S. S. "Meton" on the East Coast last night. Her TR msg. read: "S. S. Meton, New York for Taxpum, Mexico, 90 miles east north east of Taxpum." Not so bad for across the continent. We control the S. F. end of the
(Continued on page 193)

By using the Tresco tuner and a V. T. detector signals can be copied at a distance of more than 75 feet from the phones. A $\frac{1}{2}$ k. w. Thordarson transformer, Amrad quenched gap, Murdock condenser, oscillation transformer and a Roller-Smith hot wire meter are used for transmitting. The set radiates 3.8 amperes on low power. For local work an input of 10 volts is used. A wave-meter containing a Murdock 43 plate variable condenser and DeForest honeycomb coil was constructed by the owner of the station and calibrated by the Bureau of Standards. A radio telephone set is at present under construction, and a Paragon type short wave regenerative receiver is also in the course of home manufacture.

LIST OF STATIONS HEARD BY WESTERN AMATEURS

STATIONS HEARD BY 6CH

6BQ, 6CV, 6EJ, 6ER, 6FH, 6GQ, 6HY, 6IY, 6JM, 6JD, 6KA, 6KP, 6KI, 6LI, 6OH, 6OP, 6OL, 6SK, 6UM, 6VN, 6ZA, 6ZN, 7BK, 7CU, 7CD, 7DE, 7DI, 7GQ and 7ZI.

These stations were heard on an aerial fifteen feet high, suspended in a grove of trees.

STATIONS HEARD AT 6ZB

5ZA, (6AE), 6AH, (6AK), 6AN, (6AAZ), 6BJ, 6BV, 6BQ, 6BR, 6CO, 6CP, 6CV, 6 DP, (6EA), 6EC, (6EJ), (6EN), (6ER), (6EV), 6FB, 6FA, (6GE), (6GI), 6GR, (6HH), (6HU), 6HY, (6IF), (6IZ), (6JD), (6JI), 6JM, 6JT, (6KA), (6KC), (6KP), (6PI), (6ZM), CNM, 6MO, (6NP), 6NY, 6OH, (6OJ),

6OT, (6OV), (6RP), (6SK), 6QJ, (6XZ), 6ZG, (6ZH), 6ZK, 6ZL, 7AD, 7CC, 7CU, 7CW, (6VL), (6VJ), (6WN), (6WK), 6AFY, 6AFU, 6ADX, (6ADA), 6ABP, (6ADO), (6AEH).

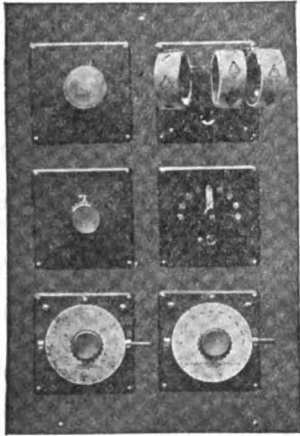
COPIED AT 6OC, SAN FRANCISCO, TO DATE

6AJ, (6AK), 6AV, 6BQ, 6CT, (6CV), (6DP), 6DH, 6EA, 6EB, (6EJ), 6EN, 6ER, (6FE), 6FH, (6FS), 6FT, 6GE, 6HY, 6IC, 6IF, 6IH, 6II, 6IL, 6IT, 6IU, (6IY-CW), 6JE, (6JD), 6JI, (6JM), 6KA, 6KE, (6KP), 6MZ, 6NY, (6OH), 6OT, 6PQ, (6PR), 6QM, 6QR, (6SK), 6TC, 6TF, 6UM, 6XZ, 6ZA, 6AAK, 6AAT, 6ABG, 6ABP, 6ACU, 6AFY, 7BJ, (7BP), 7CC, 7CF, (7CU), 7CW, (7DA), (7IN), 7JW, (7ZI), 7BQ.



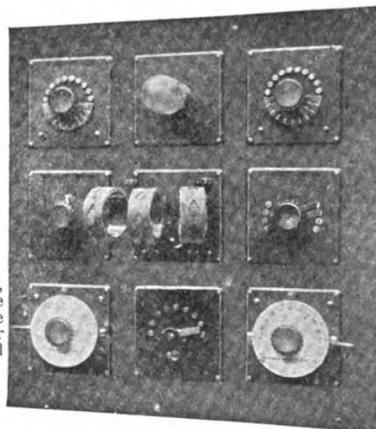
Newest Ideas in DeForest Unit-System Receiving Apparatus

A DVANTAGES of the Unit-System include extreme economy due to the simplicity and interchangeability of the Units; convenience in arranging circuits of the individual need; and greater operating efficiency due to the engineering design and quality of the instruments. The Unit Sets shown here are examples.



SIX PANEL UNIT SET

comprising a combined Tuner and Detector to receive all local stations and practically any large station in the world. Everything necessary for the operation of the set, including detector tube, "B" battery, head phones and a set of 11 coils, can be had for \$75.00 complete. (Purchaser to furnish panel board and "A" battery). This set will give greater satisfaction than any outfit at anywhere near this price. Expansion possibilities unlimited.



NINE PANEL UNIT SET

comprising the same six panels shown above, and either three additional panels to give one step of amplification, or three panels to increase the efficiency of the original six. The former will add about \$23.70 to the cost of the original six; the latter about \$12.10.

DeForest Radio Telephone & Telegraph Co.

Manufacturers and Inventors of High Grade Radio Apparatus
1415 SEDGWICK AVENUE NEW YORK, N. Y.

Lee DeForest, Inc., Western Distributors
451 THIRD STREET, SAN FRANCISCO



RADIO CLUB DIRECTORY

Published every month. It keeps you posted on important meetings.

United Radio Telegraphers' Association, Pacific Coast Division—Rooms 418-420, 24 California St., San Francisco Cal. Phone Douglas 706. All commercial operators eligible for membership. Address communications to above address.

San Francisco Radio Club, Inc., S. F. Gymnastic Club, Sutter and Divisadero Sts., San Francisco, Calif. Meetings every Tuesday evening at 8:30 P. M. Visitors welcome at any meeting except first meeting of the month. Initiation fee \$2.50. Monthly dues 50c. For experimental and commercial radio operators, address communications to the secretary. —adv.

Mr. Neilssen, radio operator on the WOG (S. S. Fred Baxter), reports copying Station 6EA with good audibility on October 30, 1920, between 10:45 and 11:30 p. m. 6EA was calling 7ZI, also working 6JR and 6ZK. The WOG was anchored in Evans Bay at Reid Island, Canada, 154 miles north of Vancouver, B. C., or approximately 1,500 miles from Los Angeles, Calif.

Station 6EB: 6AEW, 6AFY, (6AK), (6AR), 6GE, (6GF), (6GO), (6OC), 6OT, 6PJ, 6XZ, (6ZA), 6ZH and 7CC.

NAMV (U. S. S. Madrono) heard 6EB while off Cape Mendocino, Calif., at 5:15 p. m. (sun still shining).

WOG (S. S. Fred Baxter) copies 6EB while off the coast of British Columbia. Signals were reported loud and clear.

Stations heard by E. H. Harris, Santa Cruz, Calif.: 5ZA, 5ZK, 7ZK, 6JT, 6IG, 6NY and 6ZA. Stations worked: 7GY, 6NY and 6ZA.

Stations heard by 6DK: 6FS, 6IU, 6EA, (6CV), 6EJ, 6AK, 6ABP, 6FJ, 6IY, (CW), 6VO, 6AH, 6KP, 6SK, 6BJ, (6JM), 6PQ, 6KA, 6PR, 6DP, 6GF, 6JR, 6JN, 6EN, 6ZB, 6AAV, 6FD, 6AAW, 6AFV, (CW), 6EP, 6JD, 6CP, 6AAB, 6AAT, 6XZ, 6AFY, 6ER, 6AFU, 6HY, 6NY, 6AE, 6IL, 6IG, 6OY, 7ZI and 7CU. Those hearing 6DK will please QSL.

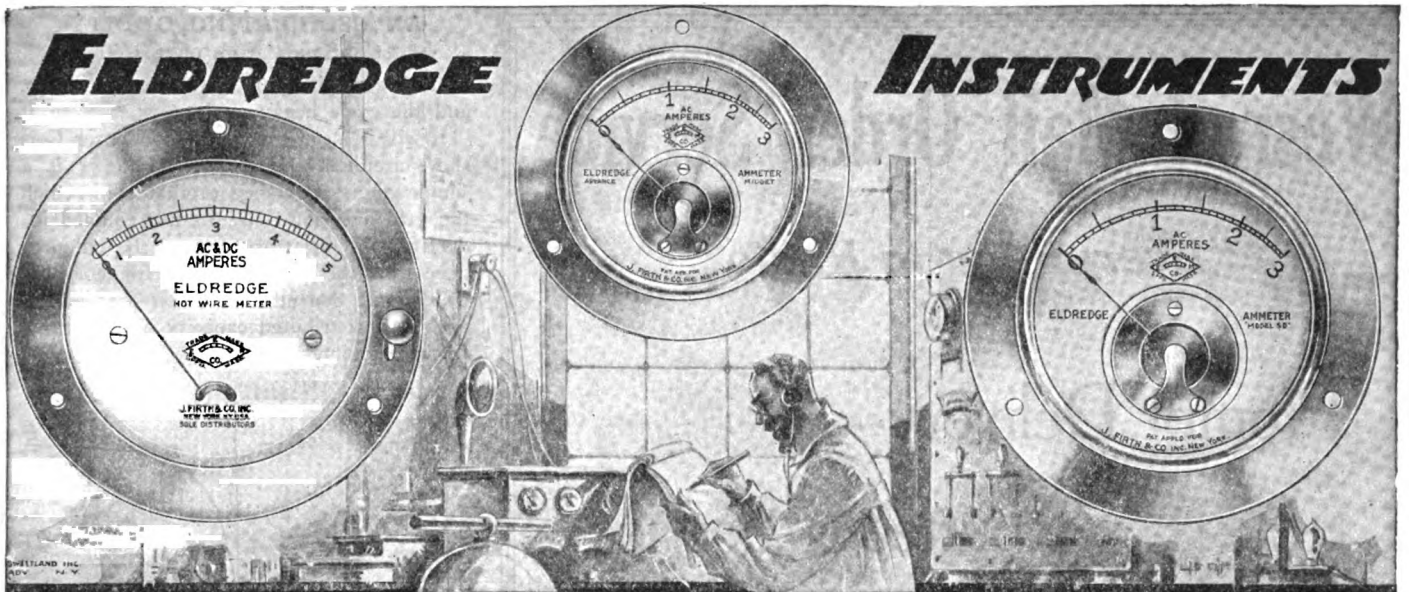
Call list correction: 6CU—Charles F. Filstead, 2010 Sixth avenue, Los Angeles, Calif.

CALLS HEARD BY 6EA (Additional)

Heard: 6ADE, 6AJ, 6GF, 6GN, 6OC, 6PR, 6UO, 6ZH, 7BP and 7DA.

Worked: 6AH, 6AR, 6CP, 6CV, 6DH, 6IC, 6JT, 6NE, 6XX, 6ZA, 6ZK, 7BQ and 7CC.

SAVE THE AMATEUR. Tell your Congressman to vote NO on Bill S4038.



Absolute Dependable Accuracy—Low Priced

The Wireless amateur has always asked for a set of good looking, neat and compact electrical measuring instruments that were unfailingly accurate and reasonably priced.

ELDREDGE Instruments fill all of these requirements. They are designed and manufactured by a firm world renowned for creating the most accurate type of miniature electrical measuring instruments.

Notes on all types: Scales calibrated individually to ensure absolute accuracy—polished nickle finish—flush mounting.

RADIO FREQUENCY AMMETERS AND MILLI-AMMETERS. Overall diameter 2 7/8". Ranges 0-600 milli-amps, 0-1, 3 and 5 amps. Price, \$7.00.

ADVANCE "MIDGET" AMMETERS AND VOLTMETERS. Ideal for small panel mounting. Embodies the improved French movement. Supplied in 12 ranges for D. C. and A. C. Price \$8. Overall diameter 2 1/2".

MODEL S-D, A. C. AMMETERS AND VOLTMETERS. Designed especially for 60 cycle transformer primary circuits. Overall diameter 2 7/8". Voltmeters, \$10.00; Ammeters, \$9.50.

Ask your dealer for literature on these instruments. If he cannot supply you, write us direct, giving his name and address.

JOHN FIRTH & CO., Inc., 18 Broadway, New York



Number 766

SEVEN SIXTY-SIX

Contains fifteen cells connected in series; solidly packed and sealed in paraffine; topped with half an inch of sealing wax rendering the unit absolutely waterproof and not effected by climatic changes.

One positive and one negative lead, both of insulated cord six inches long.

Dimensions over all: 6 1/2 in. x 4 in. x 3 in. deep.

Voltage 22 1/2 V.

This battery is particularly adapted to the use of the beginner and will give long and faithful service.

EVEREADY

Wireless "B" Batteries

SEVEN SEVENTY-FOUR

Made up of twenty-seven cells connected in series. The wooden case containing this battery is cooked in melted paraffine with a half-inch of sealing wax added after the cells are in place, making of the whole a unit impervious to moisture.

One negative and six positive terminals. All terminals have heavy brass screws and nuts. This battery allows a range of 18 to 43 volts in steps of 4 1/2 volts.

Dimensions over all 9 in. x 3 7/8 in. x 3 3/8 in. deep.

Suitable to a wide range of requirements, this type of wireless battery, will meet the needs of those who demand the best.

Number 774



The National Carbon Co., Inc.

San Francisco

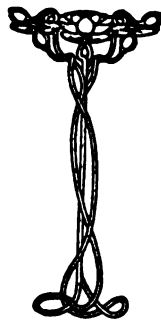
Los Angeles

599 Eighth St., San Francisco

Wesrad Mail Order Service

"Everything in Radio"

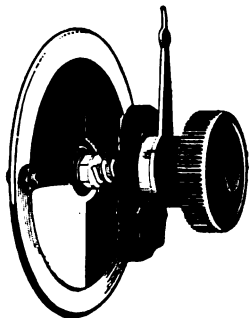
Prompt Delivery---
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A New Invention

The Parkin .001 mf Variable Condenser (pat. applied for) fills the long felt want for a rugged, low priced, balanced variable condenser for panel mounting. No plates to bend and short circuit. Cannot get out of order. Has very low minimum capacity. Easily mounted, only one small hole being necessary in the panel.

Guarantee: All Parkin Condensers are sold subject to return within five days if not fully satisfactory.

- No. 50 .001 mf Unit alone, may be mounted on any shaft...\$1.50 postpaid
- No. 51 .001 mf Unit with knob, pointer, etc., as shown.....\$2.00 postpaid
- No. 52 .001 mf Unit with knob, etc., and 3-inch black dial\$2.50 postpaid

Write for full description of this new invention

Ask for Circular No. 16

Dealers: Write for discounts

PARKIN MFG. CO., San Rafael, Calif.

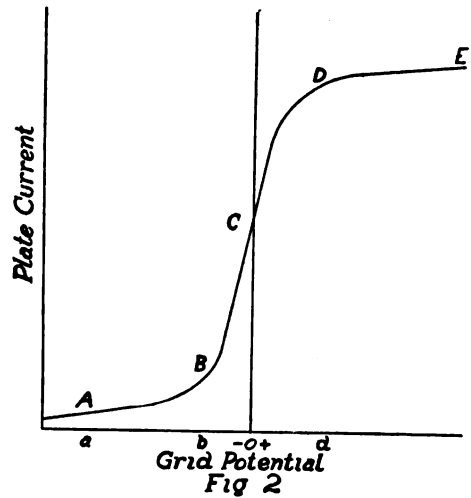
When writing to Advertisers please mention this Magazine

AN OSCILLATING ODDITY

(Continued from page 169)

rapidly as it had made the sudden jump, and the cycle began again.

It will be seen that if the condenser C is short-circuited, the circuit of Fig. 1 is a simple audio-frequency oscillator in which the grid and plate circuits are coupled inductively by the transformer. It will produce a continuous note, the frequency of which will depend chiefly on the inductance and distributed capacity of the transformer windings.



The curve in Fig. 2 is known as the characteristic curve of the valve, and is typical of the type of valve used. It is obtained by connecting batteries of various voltages between the grid and the negative end of the filament, and reading the corresponding currents in the plate circuit. When the valve is oscillating, the plate current rises and falls between the values B and D, or, in other words, from nearly zero to saturation. This, of course, means that the grid potential oscillates between the values b and d, due to the inductive coupling between the plate and grid circuits. The grid, being a cold electrode, attracts electrons from the filament when it is positive with respect to any part of the filament. When the grid is negative, it cannot, in a "hard" valve, give back electrons to the filament or space charge, except they return through the secondary of the transformer. While the valve is oscillating, the grid attracts electrons each time its potential is positive, as at d, and these electrons usually return to the filament through the secondary of the transformer, constituting what is called the grid current.

When condenser C is used the valve will start oscillating, but now no electrons can flow from the grid, and therefore the grid soon accumulates a negative charge. As soon as this negative charge reaches some value a on the lower flat portion of the characteristic curve the oscillations stop and the plate current is reduced to zero or very near it by the negative grid charge. If the insulation of the grid lead and the condenser was perfect the negative charge

(Continued on page 184)

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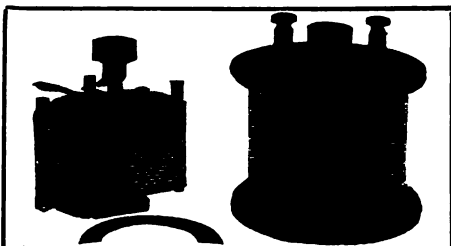
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These condensers are made by a watch mechanic, schooled in accurate workmanship and who can't get over the habit of critical inspection.

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Money back if not satisfied. Just return condenser within 10 days by insured P.P.

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The "ILLINOIS" is rapidly adding to the number of it's friends. The bouquets they fling only spur us to still more careful work, and more rigid inspection. It is a matter of pride that among the thousands of instruments sent out, not a single complaint has been received of bad condition. This may possibly be because every instrument is subjected to the scrutiny of the "old man's" eyeglass.

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A Combination that Can't be Beaten

For Results—real long-distance signals on short wave lengths you can't beat the



Relay Receiver (Type CR-3)
and
Detector and 2-Stage Amplifier
(Type RORD)

This is the Outfit which made a reputation for itself in the recent QSS tests.

You can get into the Big Relay Game and become one of the dependable long-distance men with this outfit.

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wave special. A complete receiving set

Note: All Grebe sets with the exception of the CR-7 make ideal receiving sets for wireless telephone work.

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Type	Watts	Volts	Cap.	Price
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TALK ABOUT SALE—HERE'S A GOOD ONE

—And the reason? Well it's this. The C and S Catalog is ready. We need your address to send you a catalog. So we figured that by offering these remarkably low prices, you will grasp the opportunity and order some apparatus. Thus, we will secure your address and send you a catalog. So, in this ad we are offering superlative apparatus selling at EXTREMELY LOW PRICES.

THIS EXTRAORDINARY LIBERAL OFFER POSITIVELY EXPIRES IN 30 DAYS

The Old Reliable Short Wave Amplifying Receiver

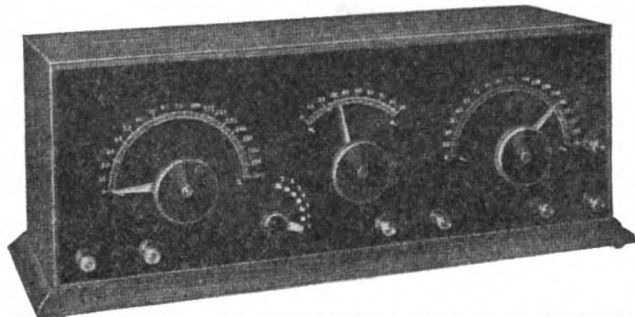
SPECIAL PRICE

ONLY

\$35

Express Two dollars extra.

Only one receiver sold to a customer



The super-sensitive, super-selective, and super-efficient short wave amplifying receiver of wide renown. We guarantee this receiver to be the best of its kind sold today. Get one today and receive those signals at marvelous intensity. Amplification 100 times. Complete receiver ready to connect up as a amplifying receiver only \$35.



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Those ultra super-sensitive detector and amplifier bulbs. Absolutely the best bulbs sold. Detector operates on 22½ plate voltage; amplifier 45 volts. For maximum results and efficiency you should use "radiotrons." Order today—while the price is low!

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\$4.50
Postage 1 lb.

Amplifier UV 201
Special price only
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Postage 1 lb.

NOT MORE THAN SIX OF EITHER TUBES SOLD TO ONE CUSTOMER



C and S NAVY TYPE DIALS Regular \$1.00 4-in. white celluloid dial 75c. Regular 75c 3-in. white celluloid dial 50c.
BAKELITE PANELS 6 in. x 6 in. x 1/8 in. only 89c. Postage 1 lb. 12 in. x 6 in. x 1/8 in. only \$1.77. Postage 1/2 lbs.

SAVE MONEY—BUY TODAY—AT ONCE
OUR STOCK LIMITED. ORDERS FILLED IN ROTATION
THE C and S RADIO-ELECTRIC CO., Dept PI-21, OMAHA, NEBRASKA

AN OSCILLATING ODDITY

(Continued from page 180)

would remain constant and no further action could occur. But what we commonly term a good insulator is really a conductor of some millions of ohms resistance. Consequently the negative electrons will flow very slowly from the grid through the glass, the base, etc., or, in other words, the grid slowly loses its negative charge. As the grid potential is changed by this "leaking" process from *a* to *b*, the plate current rises very slowly. This part of the cycle occupies the greatest length of time. As soon as the negative electrons on the grid have sufficiently "leaked off" to bring the potential to *b*, the valve will again oscillate, since the steep portion of the curve has been reached. The sudden rise in plate current takes place just as soon as the oscillations start, since the direct current component of the plate current while the valve is oscillating is much larger than its valve at *B*. The grid again accumulates a negative charge as before, and the cycle is repeated.

The length of time required for a complete cycle is usually several seconds. It depends chiefly on the following:

- Insulation of the grid and grid lead;*
- Insulation of the condenser;*
- Capacity of the condenser;*
- Filament current;*
- Plate battery voltage.*

The degree of insulation of the grid and condenser partly determines the rate at which the negative charge can leak off.

The larger the condenser the greater will be the number of electrons accumulated by the grid before its potential is sufficiently lowered to stop the oscillations, and consequently the longer it takes the grid to lose its charge. A one mf. condenser, substituted for the one-tenth mg. used at the Wireless Show, would lengthen the cycle to about 30 seconds.

The filament current and plate battery voltage partly determines the position and shape of the characteristic curve. Because of this, and other reasons, both of these quantities have something to do with the frequency of this circuit.

Anyone interested in vacuum valves will derive much knowledge of their operation, and a good deal of amusement, by connecting up this circuit and experimenting with it. Most experimenters are not equipped with a very sensitive meter, but this may be omitted, and the action studied with the telephone receiver. If the circuit does not operate at first, reverse the leads on either the secondary or primary of the transformer. The writer welcomes communications from those who try this experiment.

Stratton Electric Company

Wireless Material, Parts, Small Instruments of All Makes, Educational Books. Send for List No. 5.
215 Federal St., Greenfield, Mass.

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EXPERIMENTAL SCIENCE CO. 710 14th Street, Washington, D. C.

When writing to Advertisers please mention this Magazine

HAWAIIAN TRANSMITTER TEST
(Continued from page 173)

When we received letters from "DX" radio men stating that they copied our signals as far as 50 and 60 feet from the phones, it was hardly believable until we proved it the other night by reading the following amateurs as far as 60 feet from phones. In fact, they could be heard much further. To be sure about it, one of us stayed in the station while the other walked out in the back yard and would tell by voice in code whether the station was saying NPM or signing his own call. They are:

- 6AK60 feet
- 6EJ60 feet
- 6BJ60 feet
- 6ZK60 feet
- 6ZE50 feet
- 6BN50 feet
- 6KL50 feet
- 6OC10 feet

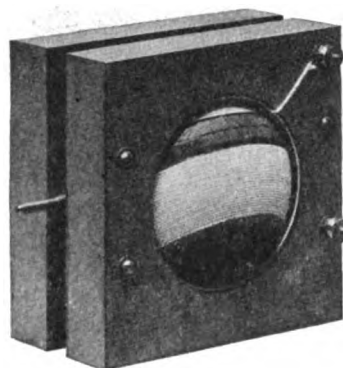
Now, in regard to the weather here on the morning of the 21st, before 2 a. m., there was a low and heavy fog and slightly "buzzy." After 2 a. m. the sky was clear, stars and moon observable, the best weather one could expect for a long distance test. About 3 a. m. the steady buzz and heavy fog came back to pay us another visit. But, thank heaven, it stayed out while the test was being carried on. It certainly came off in fine shape the 21st, but not so good the 22nd. It was pretty cloudy, and that steady buzz which we all loathe was in again. That is the next thing we will all have to fight, since we have "Old Man Static" pretty well wiped out. It seems to be in a different locality every night and is pretty hard to tell whether the power companies are to blame or "Old Man Static's" assistant. We would like to hear through "P. R. N." whether or not the amateurs from other distant points get this steady buzz business. Amateurs in Pasadena, ten miles north of us, claim they can hear it 100 feet from the phones at times.

We hope that the Honolulu test will show some remarkable records for the Pacific Coast amateurs.

We are very sorry that we will be unable to attend the convention, but will certainly experience pleasure reading all about it in the "Pacific Radio News."

Very truly yours,
Seefred Bros.,
6EA and 6 EB.

THE radio inspector at San Francisco has received a number of letters recently complaining of the working of other amateur stations. A large number of these letters have been unsigned, and it is the desire of the radio inspector to inform the writers that such letters cannot be considered unless the name and address of the writer is given.



VARIOMETER



VARIO-COUPLER

RADIO SHOP VARIOMETERS

Of original design embodying features not to be found in any others. Winding forms of seasoned stock especially selected for its non-shrinking and insulating qualities. Natural finish and treated for resistance to the elements. No dark stains, which invariably contain conducting properties, are used. Windings held in place by a special compound combining high mechanical strength with low distributive capacity—a very important item. Bearings of heavy brass bar, giving ample contact surface. This contact is strengthened by a phosphor bronze spring. Can not possibly groove the shaft. This bearing is an exclusive RADIO SHOP development. The clearance between stationary and rotating windings is correctly proportioned to give a wide and accurate range of adjustment with a minimum of distributive capacity. Shafts are of brass, one-quarter inch in diameter, milled to take a standard three-sixteenth inch dial.

Variometers, each - - - \$10.00

RADIO SHOP VARIO-COUPLERS

Of the approved rotating secondary type. Cylindrical primary winding, sectional tapped for six values of inductance. Secondary of ball type supported by aluminum castings of ample proportions and embodying the RADIO SHOP spring bearing as used in our variometers. Secondary does not rotate within the primary, but above it. This is on account of the loose coupling necessary for 200 meter work. Mounted on square wood base.

Vario-Couplers, each - - - \$8.00

STANDARD DIALS: To fit units. Three inches in diameter. Genuine Bakelite filled with brilliant white.

Dial, complete with Knob - - - \$1.30

All communications should be addressed direct to THE RADIO SHOP as the California Electric Supply Co., are NO LONGER EXCLUSIVE distributors of RADIO SHOP products.

Write for descriptive matter just off the press.

The Radio Shop

San Jose, Cal.

New Catalog of **Radio Apparatus**

Mailed Postpaid on Request
Quality Apparatus
Low Prices

RADIO APPARATUS
Our apparatus must please you—
all your money returned if it does not.

Navy Type Key
Marble Base
Silver Contacts **\$5.85**
Ask for Catalog No. 94P83.

Sears, Roebuck and Co., Chicago

Acme Amplifier \$13.00



Acme Detector \$10.00

THE ACME AMPLIFIER shown in the cut sells for a price only slightly greater than the retail price of the individual parts, which include an ACME type A-2 Amplifying Transformer, Tube Socket, Filament Rheostat, Dial, Oak Box, Engraved Bakelite Panel and Binding Posts.

The ACME DETECTOR is mounted in the same way and includes a Condenser and Grid Leak in place of the Amplifying Transformer.

Compact

Attractive

Short Connections

By connecting adjacent binding posts of two Amplifier units side by side a two-stage amplifier is obtained with separate filament control and same A and B batteries. A detector may be added to either one or two-stages with the same ease of connection.

Acme Apparatus Company 21 WINDSOR STREET,
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and prices in addition to
regular catalogue free
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numbers, which will
put new life in
your club

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RADIO APPARATUS

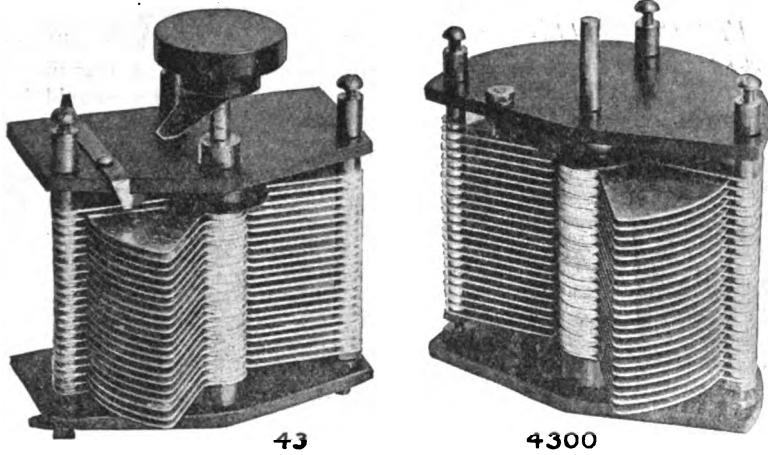
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Frank P. Herrguth Al Rosenberg
Formerly of Paul Seiler Electric Works

520 Market Street

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When writing to Advertisers please mention this Magazine



Announcing a New Variable Condenser

Built along the same general lines as our SERIES "S" condenser, but heavier construction throughout. The plates are die-stamped from 1/32" hard rolled aluminum, and are separated by heavier spacers. Extreme rigidity, best of materials, accurate machine work and careful assembly are the outstanding features of construction. At the present time we are unable to fill orders for the SERIES "S" condenser, as we are unable to obtain materials for its construction, but we can ship the NEW SERIES "T" and the SERIES "L" VARIABLE CONDENSER from stock.

REMEMBER—WE ABSOLUTELY GUARANTEE SATISFACTION OR YOUR MONEY BACK.

SERIES "T"		—PRICES—	SERIES "L"
No. 20	2 plate VERNIER	\$2.00	No. 2300 23 plate, .00075
No. 70	7 " .0001 m.f.	2.35	No. 4300 43 plate, .0013
No. 130	13 " .0002 m.f.	2.75	No. 6300 63 plate, .002
No. 170	17 " .0003 m.f.	3.15	
No. 230	23 " .0005 m.f.	3.60	
No. 310	31 " .0007 m.f.	4.30	
No. 430	43 " .001 m.f.	5.25	
No. 630	63 " .0015 m.f.	7.50	

Include postage for one pound

Either style of condenser fitted with indicating dial at additional cost of 75c.

Include postage for two pounds

The Wireless Shop

511 W. WASHINGTON STREET

A. J. Edgcomb

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Buy Your Radio Apparatus on the Pacific Coast

De Forest, Amrad, Radisco, Bunnell, Murdock, Moorhead and other apparatus carried in stock at list prices F.O.B. Seattle.

MAGNAVOX AGENCY

Arco Amplifying Transformers	\$5.00
Federal Transformers	7.50
Mica Grid Condensers	.50
Genuine Navy Rheostats	2.75
45-volt "B" Batteries	5.00
Audion Panels	11.00
Audion Panels (professional)	15.00
1-stage Amplifier	22.50
2-stage Amplifier	40.00

We reached Portland (150 miles) with our type "O" Radiophone using AC. Why not install one?

Northwest Radio Service Co.

609 Fourth Avenue

Seattle, Wash.

FORMICA

SHEETS - TUBES - RODS

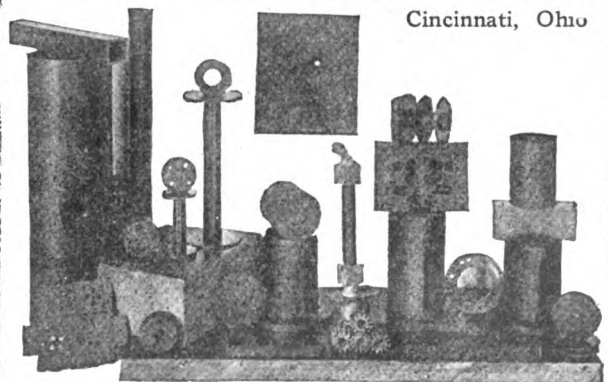
Made from Anhydrous Redmanol Resins

Formica is a homogeneous waterproof insulation with exceptionally high dielectric properties. It is readily machined and does not warp or shrink.

Formica is the ideal material for panels and other insulation parts of Radio Apparatus, on account of its superior electrical and mechanical properties, as well as its splendid appearance.

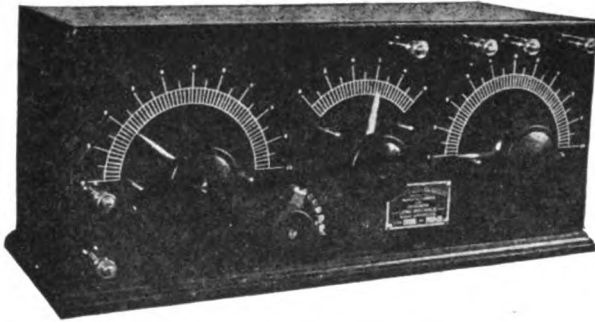
THE FORMICA INSULATION CO.

Cincinnati, Ohio



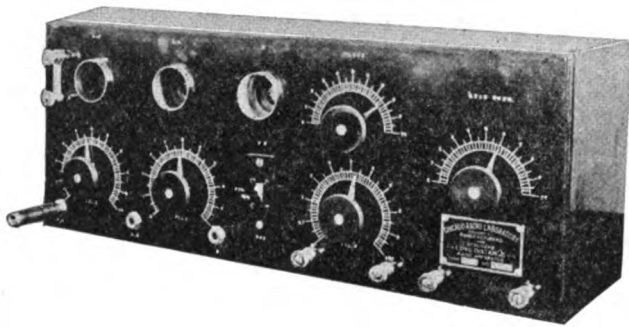
Pacific Coast Representatives:
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**It won't perch on the tree, but---
IT MAKES A "BIRD" OF AN XMAS GIFT**



C. R. L. Paragon Reg. Receiver

The C. R. L. Paragon, with its tremendous amplification factor and extreme electrical efficiency combined with mechanical perfection and convenience, makes the ideal Christmas present—and you can be sure that it will be appreciated—BUT be sure that you get the genuine C. R. L. product. Look for our name on the instrument. The genuine C. R. L. Paragon is used in almost all long distance stations throughout the country. Price, F. O. B. Chicago, \$65.00.



C. R. L. Amplifigon, Type AGN-2

**IF A "BIRD" OF A GIFT ISN'T ENOUGH FOR HIM, ADD AN
AMPLIFIGON AND MAKE IT A "WHALE"!**

The C. R. L. Amplifigon detector and two step amplifier is now equipped with phone plug and jacks for detector and each step, our special 3-way battery switch with transmitting position, extra phone posts, NON-SQUEALING transformers and many other special features. Combined with the C. R. L. Paragon, it makes up the BEST complete short wave receiver on the market today, bar NONE. Price, F. O. B. Chicago, \$105.00.

Both sets fully guaranteed for TWO YEARS.

Licensed under Armstrong and De Forest patents.

Special preparations made for Xmas deliveries. Write for our descriptive bulletin.

Chicago Radio Laboratory

1316 Carmen Ave.

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The standard insulating material for all radio work. Water-proof, permanent, strong, used by all important manufacturers of wireless apparatus and others requiring the utmost in insulation.

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THE CONTINENTAL FIBRE CO.

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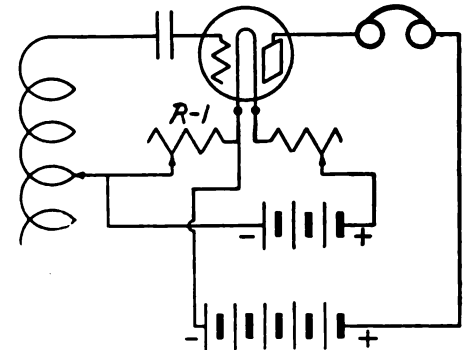
411 S. Main St., Los Angeles, Cal.

1710 Royal Bank Bldg.,

Cor. King and Yonge Sts., Toronto, Ontario, Canada

OBTAINING A NEGATIVE GRID CHARGE

THE hook-up shown here will enable the user to obtain a negative grid charge. The rheostat R-1 should be of the low ohmage type in order to permit of very close potential adjustment.



Courtesy of the Amido Apparatus Company

BOOK REVIEW

Radio Engineering Principles. By Henri Lauer and Harry L. Brown. First edition, second impression. Published by McGraw-Hill Book Company. Contains data and information on radio communication in general and covers the new and extensive developments in the art made during the war. Devoted largely to the characteristics and use of the three element vacuum tube in radio telegraphy and telephony. Mathematics resorted to only to indicate the application in the problems of design of apparatus. 300 pages. Cloth bound. Price \$3.50. Western distributors: Technical Book Shop, Rialto Building, San Francisco.

OPERATORS' GENERAL

INSTRUCTIONS AND LAND

LINE TARIFF BOOK

For use of commercial ship and shore operators. Published by the Ship Owners' Radio Service, Inc. Contains full account of rates, abstracting of messages of any character, message forms, time signal and weather information, watch hours for operators, instructions on counting of words, general traffic regulations for Shipping Board vessels, and other data of value to the commercial operator. Can be secured from any Ship Owners' Radio Service Station at \$1.50 per copy.

SAN FRANCISCO RADIO

CLUB WILL START MEM-

BERSHIP DRIVE

WITH the view of having every radio man in San Francisco on the Membership list of the San Francisco Radio Club, a new membership campaign will soon be in progress. It is planned to reduce the initiation fee to \$1 for a period of thirty days. The dues will remain at 50 cents per month.

Storage Batteries

are but one of several

hundred radio accessories supplied by us. Order anything of standard make advertised elsewhere and get immediate delivery in a single package, that's SERVICE. Send stamp for details of SAVING you can make.



- C-1 4 volt 20-40 amp hour.....\$ 7.25
- C-2 4 volt 40-60 amp hour..... 10.75
- C-3 6 volt 20-40 amp hour..... 10.75

Type "C" designed especially for lighting vacuum tube filaments. Supply limited.

- T-1 4 volt 20-40 amp hour.....\$10.75
- T-2 4 volt 40-60 amp hour..... 14.50
- T-3 6 volt 20-40 amp hour..... 16.25
- T-4 6 volt 40-60 amp hour..... 20.00

Type "T" designed for automobile trade are excellent for tube lighting.

- F-1 6 volt 60 ampere hour.....\$19.00
- F-2 6 volt 80 ampere hour..... 24.00

Type "F" designed for the new Ford car are also excellent for tube lighting or spark coil work.

Add 5 per cent excise tax to these prices which are FOB Marko factory Brooklyn, N. Y.

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ENGLAND HOOKS 'ER TO HER BULB

THE MOST WONDERFUL TUNER IN THE WORLD FOR \$10.00—ADD PARCEL POST

"On the evening of July 10th I was listening in with a companion a Marconi Operator using your 20,000 meter tuner when we heard NSS with great clearness and copied the whole of the message. We also heard NSF in communication with a U. S. War ship. We also heard NFU which we have been unable to identify. All these stations we heard quite distinctly and had no trouble in taking down the messages. The Aerial used was 70 feet twin wire on a house in the city. The valves Telefunken. The circuit the one given by you—altogether we were listening in five hours. The tuner was never silent for a moment and we received messages from dozens of stations. We considered these results excellent."
(Signed) W. R. Wade, 6 West Mall, Clifton, Bristol, England.

able to identify. All these stations we heard quite distinctly and had no trouble in taking down the messages. The Aerial used was 70 feet twin wire on a house in the city. The valves Telefunken. The circuit the one given by you—altogether we were listening in five hours. The tuner was never silent for a moment and we received messages from dozens of stations. We considered these results excellent."



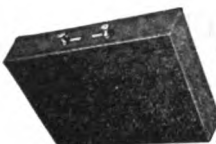
Full Size

PERFECTION BINDING POSTS—6 FOR 75c
KNOCKED DOWN OR ASSEMBLED CONDENSERS

Which kind do you want? Made for panel mounting and are complete with scale, pointer and knob. Used all over the world. No C. O. D. orders, add Parcel Post. Buy from your local dealer or send us his name if he can't supply you. Formica tops and bases. Movable plates are now held by nuts and not clamped with washer as formerly.

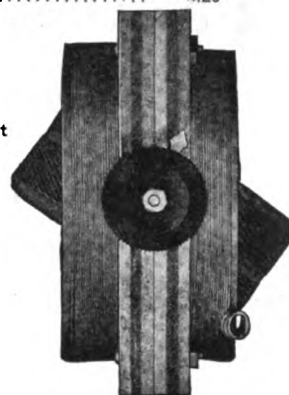
- 11 Plate K.D. \$1.80
- 21 Plate K.D. 2.25
- 41 Plate K.D. 3.20

OUR NEW CATALOG JUST OUT, BRIM-FULL OF WIRELESS DOPE. Send 10c Stamps



VARIOMETER VERY EFFICIENT \$5.00 Add P. P. Boxed in Cabinet With Scale and Pointer \$7.50

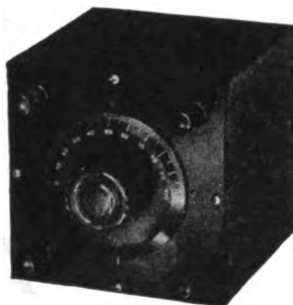
GLASS PLATE CONDENSERS 7 Plates, 15,000 volts .0015 MF. \$2.00 add P. P.



Midwest Agency for New Radiotrons

\$5.00 Each, add Parcel Post

TRESCO, Davenport, Ia.



HERE IT IS

Lattice Wound Variometers Especially Designed



Type 7

TO IMPROVE THE SHORT WAVE REGENERATIVE CIRCUIT

Realizing the need of a neat, compact and highly efficient variometer for the modern receiving set, we have produced one which we feel will meet the requirements.

Type 7 is assembled ready for panel mounting and can be easily mounted by simply drilling a 1/4-inch hole in the panel.

Type 12 is a complete unit and consists of Type 7 mounted on a 4 1/2 x 4 1/2 bakelite panel incased in a mahogany finished cabinet. Four binding posts are provided so that leads can be connected to any side.

Both types are furnished with a standard 3-inch dial and knob and make a very attractive instrument.

PRICES (Charges Prepaid)

- Type 7G (for grid circuits)\$ 7.50
- Type 7P (for plate circuits)..... 7.50
- Type 12G (for grid circuits) 12.50
- Type 12P (for plate circuits)..... 12.50

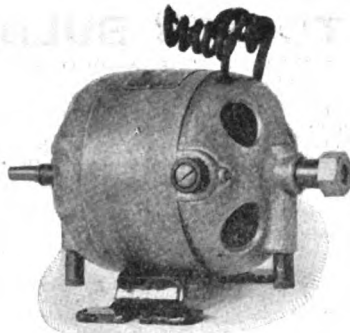
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SPECIAL SPARK GAP MOTORS

Type C-2-110 Volts Specify A. C. or D. C.
 These motors equipped with special thrust bearing. Eliminating vibration
 Price, Postpaid in U. S. **\$13.85**

Eight spark point rotor for this motor made of ¼-in. grade XX Bakelite Dilecto \$5.75 postpaid.

RAY-DI-CO.
 Radio Supplies
 2653 C. N. CLARK ST. CHICAGO, ILL.
 Specializing in the designing and construction of radiophones to your specifications



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NOW READY

Another Bulletin on Late Developments in **RADIOPHONE AND CW ACCESSORIES**
 The Nucleus is fully described, as are the component parts which may be purchased separately

Type J 0-100, 0-300, and 0-500 Milliameters, 3-inch flush type.... \$ 7.00
 Type J 0-3 and 0-5 D.C. Ammeters. 7.00
 Type J 0-500 Voltmeters (External Resistance), 3-inch flush type... 16.00
 \$10 General Radio No. 127A H. W. Ammeters, 0-1, 0-2½, 0-5 ranges 7.75
 Special Radio Microphone with Adj. Bracket 4.50
 Type CSU .0006 mfd. Balanced Var. Condenser 6.00
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Beginning the New Year Right, We Announce **PREPAYMENT OF POSTAGE ON SORALA SPECIALTIES!**
 It pays to send East for "Sorala Service"

Somerville Radio Laboratory
 102 Heath St. Somerville, 45, Mass.



DUCK'S New Big-200 Page No. 14
 Wireless Catalog 21 and 27

Mailed for 12c, either in stamps or coin, which amount you are privileged to deduct on your first order of \$1.00. Catalog positively not sent otherwise. This edition of our wireless catalog is the most complete and elaborate we have ever put out. It embraces everything in wireless worth while. As an encyclopedia of information it is invaluable. It is printed on excellent paper with a beautiful cover. Your amateur friend will tell you that there never has been any wireless catalog to take the place of Duck's, and above all, that you can absolutely rely on the quality of every instrument listed in this catalog. In a word it is all worth while catalogs in one.



Improved Type Sayville Rotary Gap

Embodies the latest and best features in Spark Gap Construction.

Our New Type Sayville Rotary Gap is, we believe, far in advance of any rotary gap on the market within a range even of twice the price. It is the final development of many different types made in our experimental Radio laboratory. It fulfills every requirement of the ideal rotary gap. It is neat and attractive in appearance; simple and durable in construction; possesses a wonderful motor; has a cast aluminum rotary wheel, beautifully polished; every part is in perfect alignment; there is no wobbling of the motor; produces and maintains a clear and pure 500-cycle note; is instantaneous in action; permits of no dragging of the spark; has contacts of tempered flat copper of proper length and width, easily and quickly removable, and inexpensively renewable; the stationary contacts are adjustable to any length.

The picture above really does not do it justice. There is no rotary gap we have ever sold that we consider in the same class with this gap, and we have therefore discontinued the sale of all other types listed in our catalog.

Any purchaser is privileged to return it within three days if it does not come up to all the high claims we make for it. A first-class Rotary Gap is the very heart of an efficient transmitting set, and we cannot too strongly emphasize care in the selection of this instrument if effective and dependable results are desired.

No. A1798—Improved Type Sayville Rotary Gap (shipping weight 9 lbs.).....\$27.50
 Renewable Rotary Electrodes (not less than five sold), each..... .05
 Renewable Stationary Electrodes, each..... .10
 Type A Motor as supplied with above gap (shipping weight 6 lbs.)..... 15.00

THE WILLIAM B. DUCK CO., 210-212 Superior St., Toledo, Ohio

Dependable
 Efficient
 Serviceable

**A
 ACE
 E**

EQUIPMENT

ACE Regenerative Receiver\$90.00
 ACE Regenerative Tuner 65.00
 ACE Audion Control Cabinet..... 22.50
 ACE One-step Amplifier (Cab. type) 27.50
 ACE Two-step Amplifier (Cab. type) 60.00
 ACE V.T. Socket with Grid Leak.. 1.50
 ACE 3½" Etched Metal Dial..... 1.50
 ACE 2-11-16" Hard Rubber Dial... 1.50
 ACE Stopping Condenser..... 1.00
 ACE Grid Condenser75

We also carry in stock a complete line of other radio equipment such as rotary gaps, transmitting transformers and condensers, oscillation transformers, keys, kickback preventers, formica panels and tubes (any size), switches, binding posts, contacts, etc., etc.

Your mail orders will receive our prompt attention. Catalog free on request.

THE PRECISION EQUIPMENT CO.
 2437 GILBERT AVE., Dept. F
 CINCINNATI, OHIO

When writing to Advertisers please mention this Magazine

Audion Control Panels

Panel size 4x6½ in. of Polished Forkica, use V. T. or Auditron Tube, Rheostat, Grid condensor, B battery control, 6 binding post, mounted on brackets, all metal parts highly nickel plated and polished,, 30 day special price \$6.25 prepaid.

One Step Amplifier

Panel size 4x6½ in. 30 day special price \$12.25 prepaid.

Two Step Amplifier

Panel size 6½x8 in. 30 day special price \$22.50 prepaid

Ask for Illustrated Literature Free

Keystone Radio Company

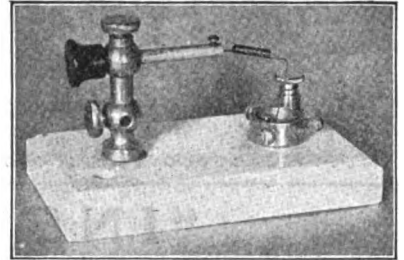
Manufacturers and Dealers

Drawer 307

GREENVILLE, PENN.

Attention WIRELESS AMATEURS

THE ONLY WIRELESS MINERAL DETECTOR MADE ON A SOLID PORCELAIN BASE. See Cut



This Mineral Detector is a most valuable device to eliminate the Amateur's troubles in Wireless Operating

PRICE \$2.25 EACH

Including Parcel Post Charges

J. N. BREIDENBACH

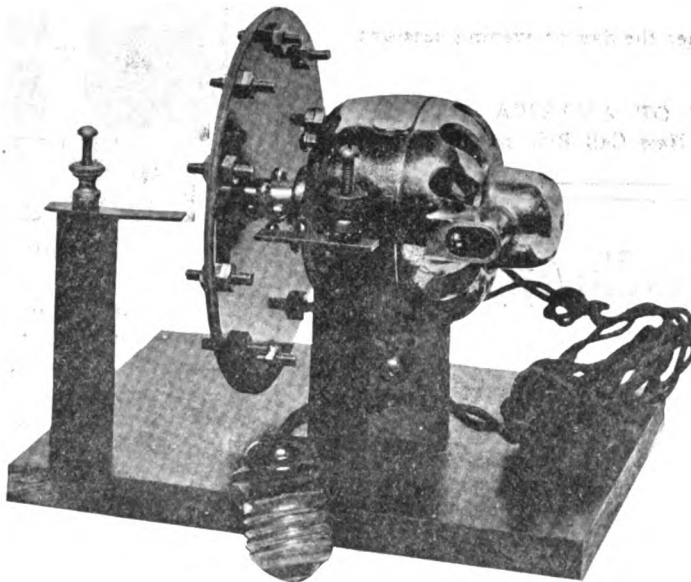
2413 North 16th St., Phila., Pa.

LET THIS BE YOUR NEW YEAR'S RESOLUTION—

Resolved—That I will Use a Good Rotary Gap Throughout the Year of 1921 and Will Cease to Jam the Air With that Inefficient, Mushy Spark.

A GOOD ROTARY GAP IS A RADIATION BOOSTER

The illustration shows our commercial type Rotary Gap with 110 Volt Motor. Will operate on either A. C. or D. C. Ten Stud Motor, constructed of best grade Bakelite Hard Rubber Stationary Electrode Supports. Cord and Plug Attachment Supplied with each Gap.



\$12.00

Include Postage on eleven pounds

THIS GAP WILL HANDLE ONE KILOWATT SAFELY. ROTARY AND STATIONARY ELECTRODES ARE EASILY RENEWED.

Our New Bakelite Audion Control Panel with V.T. Socket, Rheostat, "B" Battery Switch, Nicked Binding Posts and Brackets for Table Mounting, \$8.00.

RADIO DEVELOPMENT COMPANY

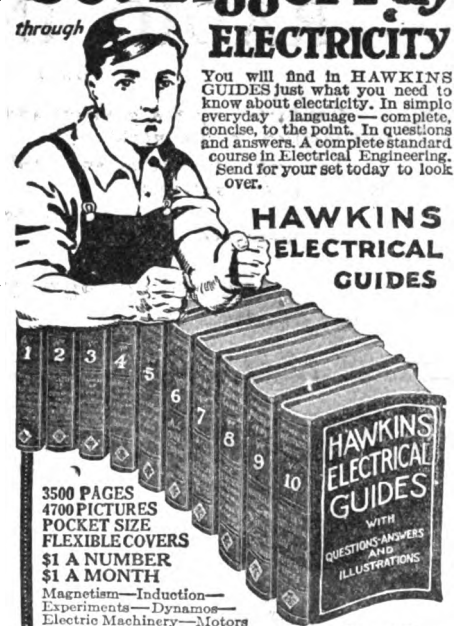
Manufacturers of High-Grade Radio Apparatus

P. O. BOX 2114

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You will find in HAWKINS GUIDES just what you need to know about electricity. In simple everyday language—complete, concise, to the point. In questions and answers. A complete standard course in Electrical Engineering. Send for your set today to look over.



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4700 PICTURES
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Shipped to you FREE. Not a cent to pay until you see the books. No obligation to buy unless you are satisfied.

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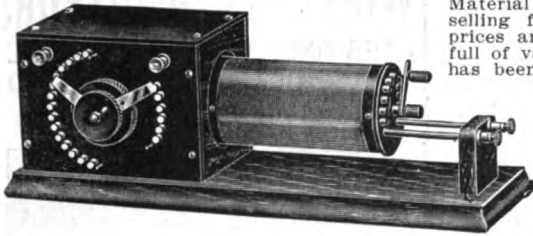
SEND NO MONEY

THEO. AUDEL & CO., 72 Fifth Ave., N. Y. Please submit for examination Hawkins Electrical Guides (Price \$1 each). Ship at once, prepaid, the 10 numbers. If satisfactory, I agree to send you \$1 within seven days and to further mail you \$1 each month until paid.

Signature _____
Occupation _____
Employed by _____
Residence _____
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Arnold Navy Type Loose Coupler



Send 3c stamps for Bulletin No. 3

PRICE, \$20.00

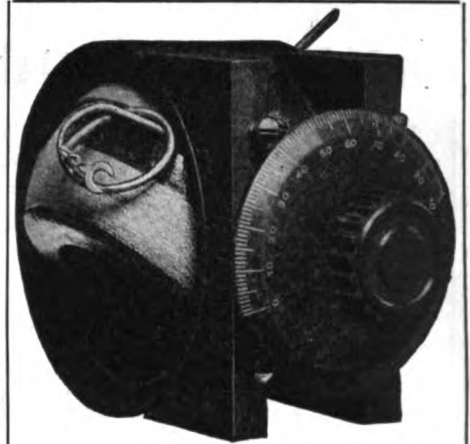
This Instrument is made of the best Material obtainable and is equal to others selling for \$25.00 and higher, all fancy prices and frills are eliminated, is chock full of value and is made by a man who has been before the public for the past 8 years making Wireless apparatus.

It will tune up to 3,500 meters. I also stock the finest line of switch points, Hard Rubber knobs, Cabinets and accessories on the market. Prompt delivery of all orders has distinguished me.

J. F. ARNOLD

Established 1910

2082 LEXINGTON AVENUE
NEW YORK CITY

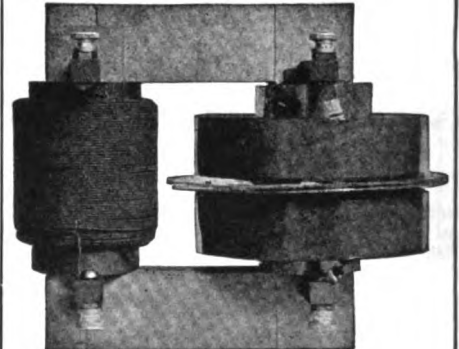


TYPE Z. R. V.

Variometer has unit construction with bakelite shell and hardwood ball. Has low dielectric losses and a range of inductance of 1.25 mil henry maxim to .1 mil henry minimum. Is readily used on table or mounted on panels.

Complete with 3-inch dial and knob \$6.50

Without dial or knob.....\$5.75



TYPE Z. R. L.

Transformer for use with rotary spark gap has two section secondary, bakelite terminal supports and high grade construction, 400 watts power rating highly efficient at 200 meters.

Price \$14.00

Apparatus which excels in those qualities which for 13 years of continuous manufacture have maintained its enviable reputation for reliability will be found pre-eminent in the display rooms of discriminating dealers and is manufactured by

CLAPP-EASTHAM COMPANY

140 Main St., Cambridge, Mass.

Catalogs mailed for 6c stamps.

"INSULATE"

Knobs, Handles

and

INSULATION SPECIALTIES

for WIRELESS, etc.

moulded of "INSULATE"

Best Substitute for Hard Rubber or "HI-HEET" resisting synthetic material

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1026 Atlantic Ave.

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--RADIO INSTITUTE--

OF AMERICA

Conducted by the greatest and most experienced radio telegraph organization in the world.

Thorough training given in radio operating, traffic, and in damped and undamped systems.

Tuition ten dollars a month for either the day or evening sessions or both combined.

RADIO CORPORATION OF AMERICA

Phone Douglas 3030

335 New Call Bld., San Francisco

WE RECOMMEND "Saco Radio Apparatus"



Price.....\$50.00

The Audion Control Panel illustrated is the very best of its kind. It has a variable grid condenser to control the grid potential, a filament ammeter, telephone condenser, plug type grid leak, etc.

The Two Stage Amplifier illustrated at the right is guaranteed against squealing and howling as found with other makes of amplifying units. They can be used with equal success in amplifying radio telegraph and telephone signals without distorting the incoming signal.



Price.....\$50.00

Order anything in RADIO PARTS or made up—
We have it.

American Electro Technical Appliance Company

Dept. P.R. 235 Fulton Street New York

THE EDITOR'S MAIL BAG

(Continued from page 177)

air mail service radio stations. It is getting to be quite a circuit. They are using 2 k. w. arcs on the western division and some 5 k. w. sparks in the East. They average time for a message to get back East on this circuit is about 45 minutes. They are installing radio telephones on the airplanes now. Radio seems to be taking quite a forward march. Your "Pacific Radio News" is very interesting.

Yours truly,
DANTE H. CORDANO,
 U. S. Naval Radio Station,
 Goat Island, Calif.

Remember, If S4038 is made a law it will seriously harm the amateur. Protest the passage of this dangerous bill today—don't wait until tomorrow.

Station 6ZE,
 1247 Forty-seventh Avenue,
 San Francisco, Calif.,
 December 8, 1920.

Pacific Radio News,
 50 Main Street,
 San Francisco, Calif.

Gentlemen:

In connection with the Honolulu transmitting test on November 21st last, concerning which your representative requested me to state the exact time I transmitted and thus started the test, together with the matter sent, I will state that at 2:32 a. m., San Francisco time (12:02 p. m., Honolulu time), I started, and called NPM for one and a half minutes on my 60 cycle non-synchronous spark on 200 meters and then shut down. I called NPM again on both buzzer modulated, and pure continuous wave for the remainder of the three-minute period and then broke off and told 6BJ to go ahead. The undamped wave set was radiating exactly one and a half amperes on 230 meters, using 4 vacuum tubes, with about 400 volts on the plate. Being able to receive at the same time the transmitter was operating. I left the CW set run for a few minutes longer in order to have it ready for communication again in case I should need to start the next station, knowing that it would not interfere with the test owing to its extreme sharpness, and because of its being considerably over the normal amateur wave of 200 meters. I shut the transmitter down at about 2:39 or 2:40 a. m.

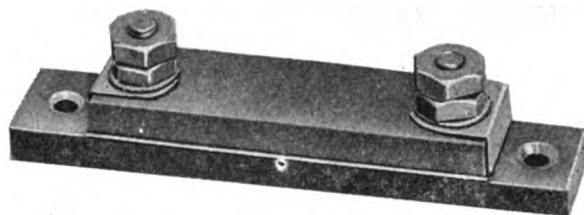
Trusting this information will be satisfactory, I remain,

Yours very truly,
D. B. McGOWN.

P. H. Boucheron, formerly associate editor of the "Radio News," is now connected with the Radio Corporation of America as assistant to Mr. Elmer E. Bucher in their sales department.

Makes Audions function properly

Ever have trouble making your audion set behave? Perhaps the vacuum tube oscillates too freely. Perhaps the regeneration is faulty. But, whatever it is, the **Pen Brand Grid Condenser** will cure that trouble. The grid condenser is the most important part of an audion set. The grid of an audion is its control element. And the **Pen Brand Grid Condenser** makes the audion grid function properly.



THE PEN BRAND GRID CONDENSER—

Firm, strong, rigid and substantial. 3-in. long. 5/8-in. wide, 3/4-in. deep, properly insulated, and carefully made of best grade materials—formica, heavy copper foil and India mica. This construction will not absorb moisture. Every one guaranteed to work and serve satisfactorily or money refunded. No matter what audion set you are now using, Pen Brand Grid Condensers will increase the efficiency of that set. If your dealer does not have Pen Brand, order direct from us.

Dealers and distributors—our trade proposition will interest you. Write for it.

\$1 POSTPAID ANYWHERE IN AMERICA

OTHER PEN BRAND PRODUCTS—

Note the low prices. Nothing is omitted from the construction of Pen Brand Products that will make them work better and wear longer, but no money is wasted adding unnecessary decorations or creating false appearances. Thus you get good, serviceable, guaranteed apparatus at very small cost. If your dealer cannot supply you with these Pen Products, write us direct. Order by number.

TRTS-31—Audion Control Panel—price \$12.50. Panel 5x9 inches, ready for cabinet mounting, and complete with latest improvements including eleven switch contacts, 'arc' and 'spark' switch and points. Complete description on request.

TRTS-32—Audion Control Panel—price \$12.50. Panel 3x9 inches. Particularly adapted for use where compact and efficient control panel is wanted for limited space. Equipped with Pen Brand Grid Condenser. Latest construction features.

TRTS-33—Amplifier Control Panel—price \$18.00. Panel 3x9 inches. Made to operate in conjunction with TRTS-32 audion control panel. Same size and when placed side by side makes a very attractive combination.

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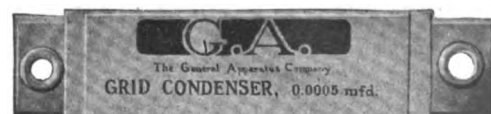
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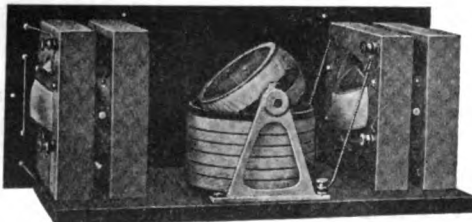
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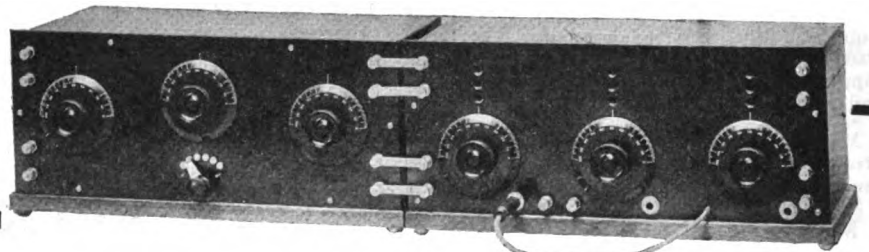
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Inside view of RADIO SHOP short-wave Regenerative Receiver, showing variometers and vario-coupler. Licensed under Armstrong U. S. Patent No. 1,113,149.



Cut showing the RADIO SHOP short wave Regenerative Receiver combined with the RADIO SHOP Detector and two-step Amplifier. The California Electric Supply Co. is a distributor for this apparatus manufactured by the San Jose (Cal.) Radio Shop.

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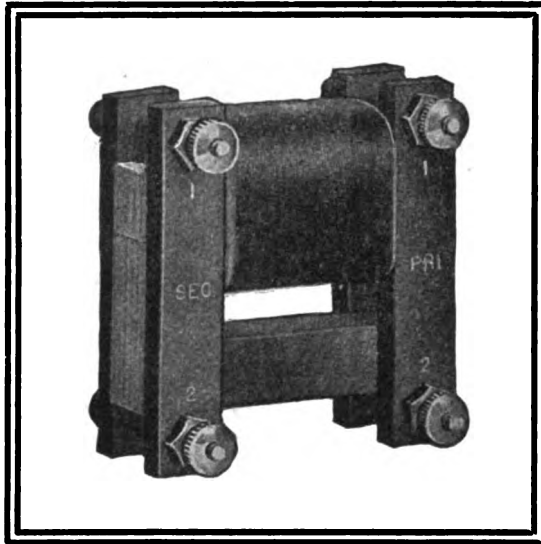
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