BEGINNING VOLUME THREE

ANNIVERSARY NUMBER

RADIO WORLD

Title Reg. U. S. Pat. Off.

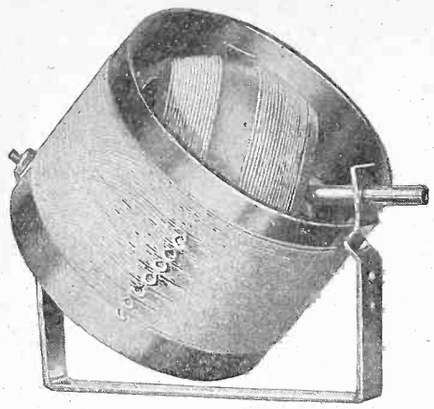
ILLUSTRATED WEEKLY

15c. a Copy Vol-3 No.53 MARCH 31, 1923 $6.00 a Year

This Radio World is the best of fifty-three numbers - in pictures, articles and service. Hennessy Editor

Factors Which Affect Selectivity (See Inside)

$2.75



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Mechanically perfect. Scientific in design. Enables high efficiency in single selection by Vernier control. Gradual variations of coupling over 180 degrees. Made to last longer.

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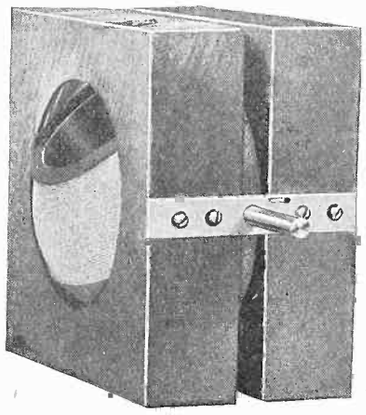

Sidbenel Variometers

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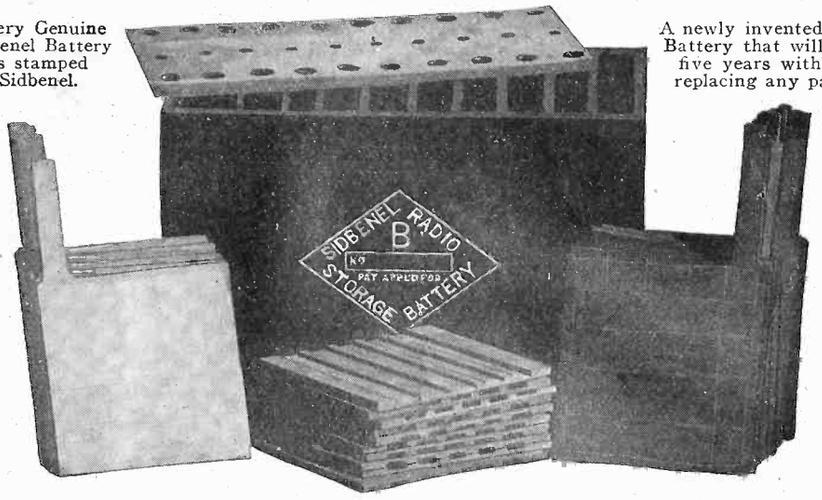
Every Genuine Sidbenel Battery is stamped Sidbenel.

A newly invented "B" Battery that will last five years without replacing any part.



OVER 10,000 SIDBENEL STORAGE "B" BATTERIES have been sold in the last few months. This is conclusive proof that it is the desired radio "B" battery. It will outlast any other type of battery and possesses every known improvement. The patented features include the composition and treatment of the plates, which is entirely different from any other battery. The plates are especially treated with a newly discovered chemical that enables you to draw as low as ten milliamperes without causing the electrical reaction which is a constant internal discharging of the batteries when insufficient current is being drawn from the plates. This self-discharging of the plates, causing the cricking and howling heard in various degrees of loudness in the receivers when using other batteries. It has been proven by actual test that SIDBENEL STORAGE "B" BATTERIES is the only battery that eliminates this electrical reaction.

Each unit is constructed in one piece of hard rubber moulded into ten compartments. Each complete unit is 2½ in. x 3 in. x 4½ in. Note the rigid and substantial construction as shown in the illustration. A special heavy ridge runs through the bottom making it practically unbreakable and enabling us to guarantee it against leakage. The cover is easily detachable allowing you to give the battery a thorough inspection without removing the plates.

A single charge lasts approximately six months. It is recharged in a few hours from A.C. or D.C. lamp socket or farm lighting generator to its original full capacity.

The enormous amount of energy enables the vacuum tube to make weak signals exceptionally loud and clear. You will notice the wonderful improvement in reception on your first trial.

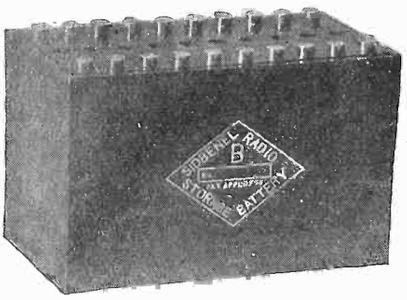
The units are bottom heavy so that they will not turn over. All the features of the SIDBENEL BATTERY are covered by our patents.

Complete battery weighs only 2¼ lbs.

There are no "just as good" batteries. Our trade mark is on every unit.

The battery is shipped to you assembled, or partly assembled. When buying unassembled all you have to do is connect the plates together. This takes less than ten minutes. Any boy can do it. Illustrations and plain instructions with each battery. The plates are already formed and charged before shipping.

Each unit can be tapped at any desired voltage. Full capacity is 22½ volts. For higher voltage simply connect additional units in series.



One single unit—23 volts—variable from 2 volts up.....$4.25

Two single units	**$8.10**	**Five single units**	**$18.50**
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ASSEMBLED PER UNIT $4.65

STANDARD *Sidbenel* RADIO "A"

Every Sidbenel A Battery is made from the very finest materials that can be obtained. Sidbenel A Batteries are the products of a firm long established whose motto is "We must build the best." We have never wavered from our policy to ignore quantity production and to preserve quality. Our principle and business methods are as sound and conscientiously honest as the Sidbenel Battery itself.

"You can always depend on Sidbenel—absolutely."

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RADIO WORLD, March 31, 1923. Vol. III, No. 1, Whole No. 53. Price 15 cents per copy, $6 per year in U. S. and possessions.
A weekly journal, published every Wednesday and dated Saturday, by Hennessy Radio Publications Corporation from Publication Office, 1493 Broadway, New York, N. Y. Telephone: Bryant 4796.
[Entered as second-class matter, March 28, 1922, at the Post Office at New York, N. Y., under the Act of March 3, 1879]

FADA "ONE-SIXTY" RECEIVERS

Using the Famous NEUTRODYNE Circuit

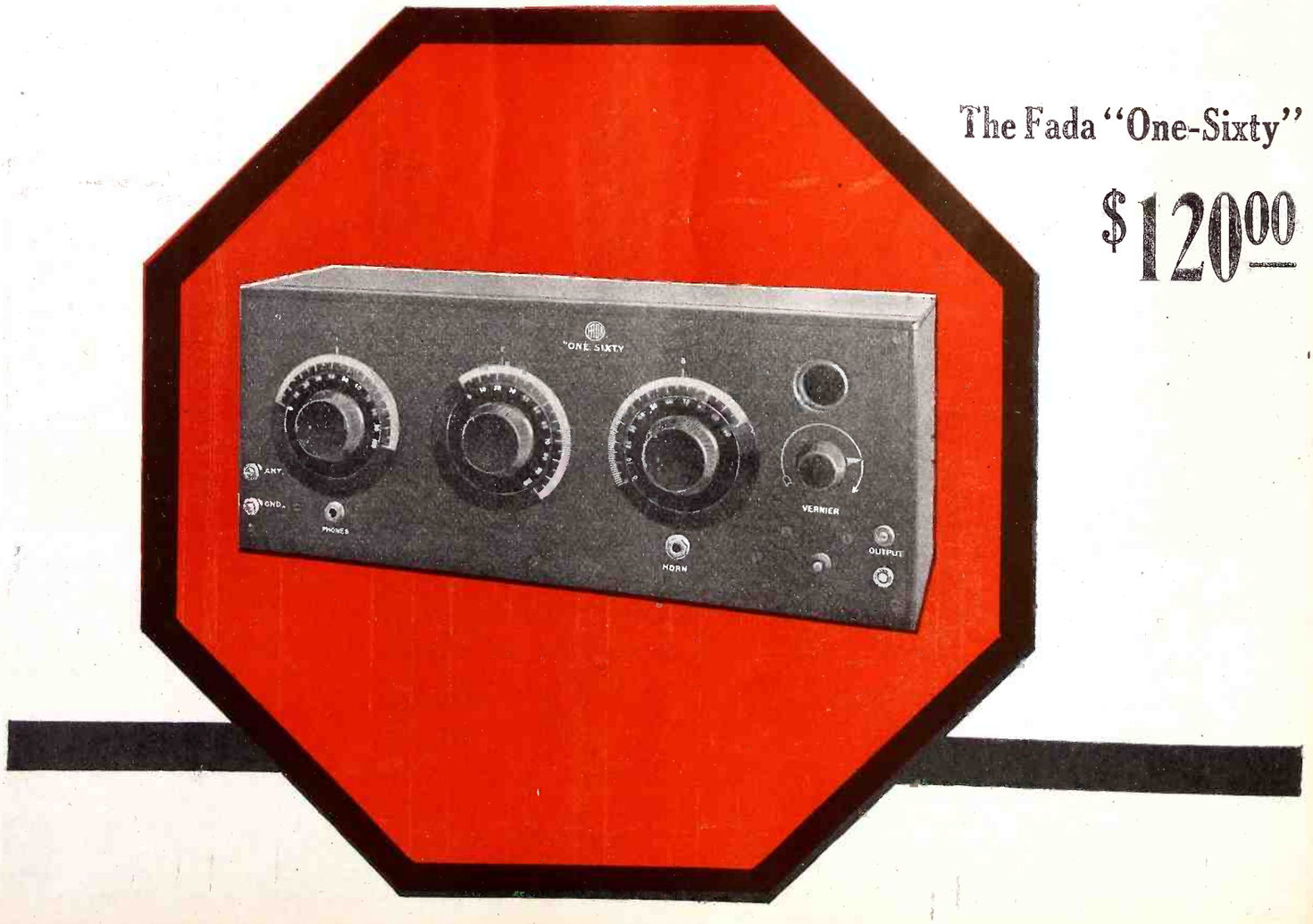
A four-tube reflex receiver incorporating two stages of tuned radio frequency amplification, vacuum tube detector, and two stages of audio frequency amplification. The **Neutrodyne** circuit neutralizes the capacity coupling of the circuit, allowing very efficient radio frequency amplification. From New York City using only a fifty foot indoor antenna every class B broadcasting station in the United States is heard with loud speaker intensity. Concerts from KF1, Los Angeles, WOA1, San Antonio, Texas, and PWX, Habana, Cuba, are enjoyed most every night.

Truly—here is the ideal receiver.

SEND for a bulletin telling about the marvelous FADA "One-Sixty" Neutrodyne Receiver.

F. A. D. ANDREA, INC.

1581-W JEROME AVE. NEW YORK CITY



The Fada "One-Sixty"

$120.00

VOLUME THREE OF

RADIO WORLD

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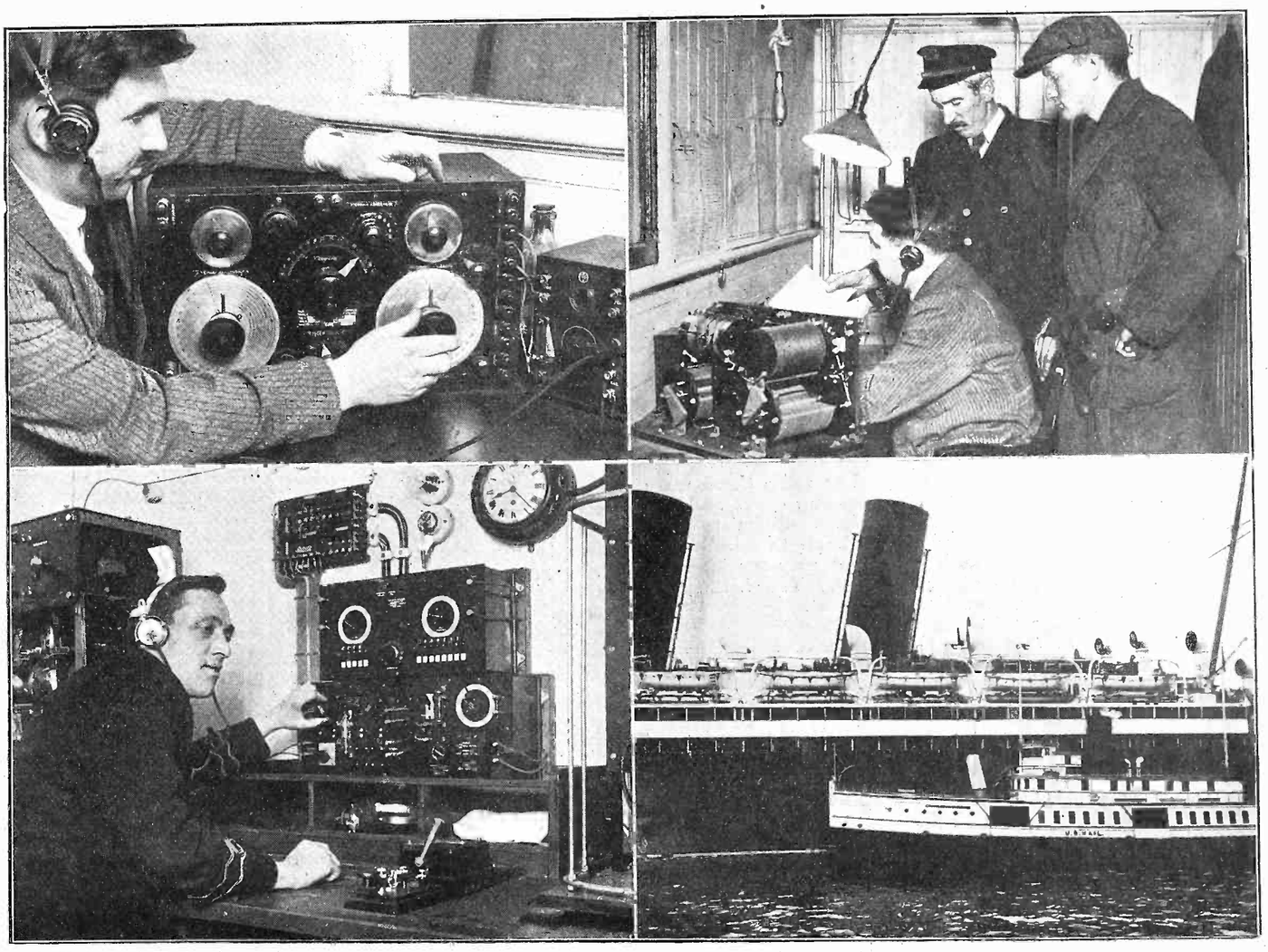
U. S. S. "President" First Radio Equipped Mail Boat in Service

By John Kent

The illustration below shows Operator M. G. Carter, with the new navy type regenerative receiver used on board the mail boat "President." It has a range of from 250 to 3,500 meters.

Captain A. Hillary, master, receiving information from the S.S. "Majestic" by means of radio. This picture also illustrates the interior of the receiver shown complete on the left.



(C. Kadel and Herbert)

The above illustration shows the powerful transmitter and receiver on board the S.S. "Majestic." First Operator F. Garwood informing the mail boat just how much mail to expect.

This picture shows mail being transferred from the S.S. "Majestic," one of the palaces of the sea, to the U. S. mail boat "President," one of the "mail carriers of the ocean lanes."

ALONG with the increase in imports and exports, there, of course, comes an increase in the amount of foreign mail arriving in this country. It is the custom of the mail boats to meet the large steamers down New York Bay to collect the mail so that everything will be facilitated and speed made possible.

The latest improvement to increase the efficiency in the handling of the mail, was equipping the U. S. Mail Boat "President" with an up-to-the-minute radio receiving set and powerful transmitter. Before the boat was equipped it was impossible to determine accurately just how many bags of mail the incoming liners had. But now, by means of radio, the mail boat is always in direct communication with the incoming boats and therefore can be informed how much mail is aboard.

This information is very valuable to the service, for otherwise the officials would not know how many men to send out to meet the incoming liner to help handle the ship's mail.

The radio installation made on the "President" is the latest type of apparatus used by the government. Competent and experienced operators are being trained to meet the demand when all the boats in the service are thus equipped, which will be in the near future.

Letters of Congratulation to Radio World on Its Anniversary

FROM HON. THEODORE ROOSEVELT, ASSISTANT SECRETARY OF THE NAVY

I am pleased to learn that your publication, RADIO WORLD, has been favorably received, and trust that it will continue to meet with success.

The Navy Department is keenly interested in all movements to further the progress of radio, whether by education, by research, or by design, as it is firmly believed that the science of radio communication is an invaluable adjunct to national industrial progress as well as to the national defense.

FROM DR. A. E. KENNELLY, PROFESSOR OF ELECTRICAL ENGINEERING, MASSACHUSETTS INSTITUTE OF TECHNOLOGY

I am glad to hear that RADIO WORLD has come through its first year of public service in good health and doing well.

The subject of world communication calls for our best abilities in radio communication in addition to all that can be furnished by wire and cable. There is something marvelously fascinating about radio and its work that the public is always ready to listen to, if suitably presented, and it seems to me RADIO WORLD is undertaking a share of that task with satisfaction and success. I wish it continued and yet increasing success in the future.

FROM DR. LEE DE FOREST, WIRELESS PIONEER

I congratulate RADIO WORLD on the success which it has attained. It has done more than its share in arousing and keeping alive the ever-increasing popular interest in this manificent new art of radio broadcast.

I wish RADIO WORLD and its staff continued and renewed success.

FROM DR. FRANK CRANE, EDITOR "CURRENT OPINION"

Radio has literally opened up a new world, and the possibilities that lie within it are staggering to the imagination. Every intelligent person must be interested in the progress made in this important field.

FROM JACK BINNS, RADIO EDITOR, "NEW YORK TRIBUNE"

When public interest was first attracted to radio there were many pessimists who said: "It is just a passing craze and will soon die out like other crazes have." These pessimists have already been refuted and radio has shown itself to be a public utility of very great importance, besides being a very interesting and entertaining means of amusement. The history of RADIO WORLD clearly proves this statement.

FROM GENERAL J. G. HARBORD, PRESIDENT RADIO CORPORATION OF AMERICA

It is a pleasure to pass on to you and to readers of RADIO WORLD a few remarks concerning some of my views on radio broadcasting.

Broadcasting appeals to the imagination as no other invention of the times. Its possibilities are beyond human comprehension. It is the romance and the inspiration of the world's splendid prime. No permanent record of the last act of "Il Trovatore," as given by the Chicago Grand Opera Company and actually heard in New York—no record, although equally perfect in its reproduction, is equal or comparable to hearing it by radio at the second it was rendered. One is history, the other action, timely and instantaneous.

The value of broadcasting to any individual or community will be in proportion to the difficulty of getting the same thing by any other means. Next to saving life at sea, radio's greatest service will be through the intelligent broadcasting of programs that will not only satisfy the desires of the average listener from an entertainment point of view, but will also be an interpreter of public tastes and opinions and of practical value in the furnishing of news, market reports, weather reports, time signals and religious services to people who live in remote districts.

Of one thing we are certain: Broadcasting is here to stay. But who is going to do it in the future and who is going to pay for it is a question which I cannot answer. But it seems to me that it must be organized and administered as a national service with the ideal, "the greatest good to the greatest number" as the watchword. If such a situation is brought about, it will, no doubt, be possible to devise some means to obtain compensation for the service either from manufacturers and distributors of radio apparatus, suitable contribution from listeners, or from the public-spirited endowment of a Carnegie or Rockefeller.

FROM REAR ADMIRAL W. A. MOFFETT, U. S. N., CHIEF BUREAU OF AERONAUTICS, UNITED STATES NAVY

My congratulations upon the success which RADIO WORLD has met, and I am truly pleased at this.

To naval aviation radio is one of our most important instruments for successful operation. Its use in communication between aircraft in flight, between aircraft and ship and between aircraft and shore has tremendously enhanced the value of aircraft in warfare. The development of aircraft radio and the development of the use of aircraft in fleet operations go hand in hand.

I wish RADIO WORLD every possible prosperity.

Radio on the Pacific

ALTHOUGH there are thirteen cables on the Atlantic, one cable only connects the United States with the Far East—that of the Pacific Commercial Company.

This cable has a limited capacity and is out of commission frequently for months at a time, due to the coral formation on the ocean's bottom between Guam and Manila. There has been some talk of another Pacific cable, but the physical conditions of the bottom are such that the laying of a second cable is a very expensive proposition. With the increasing facilities offered by radio, it is doubtful if the necessary money could be subscribed to finance such an undertaking, Naval experts believe.

The Navy has several radio circuits across the Pacific, the giant of which, both in length and volume of traffic, is that from San Francisco to Cavite in the Philippines. About one-third of all traffic goes clear across the Pacific and the other two-thirds is relayed at Honolulu or Guam, or both. There is a half-hourly schedule between San Francisco and Honolulu so that this service is practically continuous. Commercial traffic cannot be accepted at the San Francisco Naval station for Honolulu, although it is handled by points beyond Honolulu. Press traffic only is carried between San Francisco and Honolulu. Across the Pacific, Naval stations are located at Honolulu, Guam and Cavite and reaching to the southward, there is one at Tutuila, in the Samoan Islands. From Guam to Japan, messages are transmitted by cable, although there is no reason why radio could not be used if Japan would open its stations to such messages.

In Alaska, the principal Naval radio stations are at Sitka, Ketchikan, Seward, Kodiak, Cordova, Dutch Harbor and St. Paul. As the Alaska cable is often out of commission, this chain is frequently called upon to accept commercial messages for the northwest. The Naval radio station at Cavite is in communication with French Indo-China and the Dutch East Indies, and a commercial traffic agreement with the respective administrations exists. Northward from Cavite are the circuits to Peking and Shanghai.

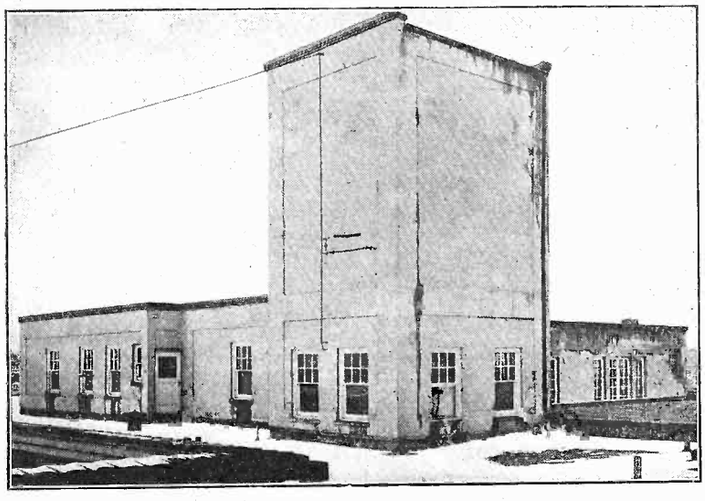
Newark Apartment Building First to Give Tenants Complete Radio Service

NEWARK, N. J., claims the distinction of being the first city in which apartment house owners give their tenants complete radio service.

This service, which in truth might be said to be the last word in modern improvements, is accomplished by means of an adaptation of the Western Electric Company's public address system installed in the pent house atop the Ritz Apartments at 299 Clinton avenue, Newark, N. J.

In any of the 72 suites a member of a family, by merely slipping on a headset and inserting a convenient plug, can comfortably sit in his or her home and listen to the country's best radio programs.

F. B. Kopff, the superintendent of the building, says the popularity of this innovation in apartment house service is evidenced by the fact that but comparatively little elevator service is required in the evenings; the greater number of the Ritz tenants prefer to stay in and listen in to radio programs.



(C. Western Electric Co.)
Pent house and radio room atop the Ritz Apartments, Newark, N. J., the first radio equipped apartment house on record.

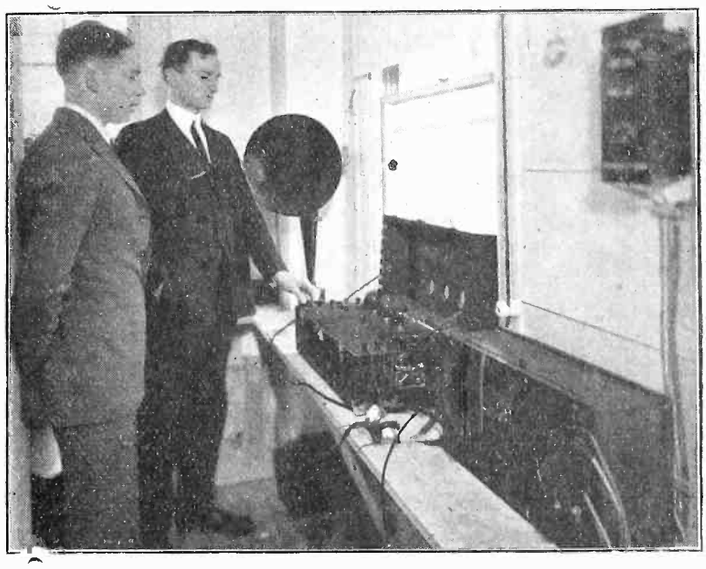
The operator up in the radio room on the Ritz roof must needs combine diplomacy with ability when he selects and picks up from the air a program that will suit the preferences of all the people in the 72 apartments. But thus far he has been so successful in his selection that even a loud speaker could not make the complaints audible, for there have been none. However, should such a contingency ever occur, it will be readily taken care of by installing an additional radio receiving set.

The equipment now used gives adequate service. It consists of a radio receiving set and a high-power amplifier. There are four vacuum tubes in the receiver which provide a means of detection, two stages of radio frequency and a single stage of audio frenquency amplification. The complete set can be operated on dry batteries.

Because of the set's sensitiveness and selectivity every city in the country which has a 500-watt broadcasting station has been heard by the families living in the Ritz Apartments.

By means of a specially designed input coil, the radio receiver is connected to a Western Electric amplifier. Power type tubes provide three stages of audio frequency amplification, the last stage being push and pull. Incoming radio signals detected by the radio receiver are amplified and thence wired to all of the 72 apartments, each of which is equipped with a Western Electric headset of high impedance type and with a special receptacle. The telephone jacks used in these receptacles are so arranged that no matter whether a few or all 72 headsets be used, the quality and volume will be in no wise impaired.

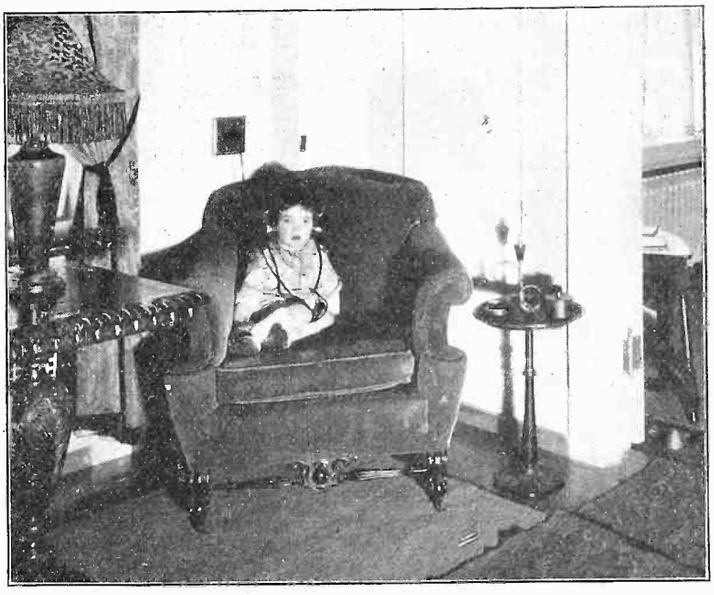
The possibility that apartment houses which provide



(C. Western Electric Co.
David H. O'Brien, of the Western Electric Co., and William McNeery (The Man-in-the-Moon) in the radio room of the Ritz Apartments.

radio service may become as tumultuous as the Tower of Babel is easily averted. By using headsets rather than loud speaking projectors, there can be no "bedlam," and each lessee is given clear reception.

Superintendent Kopff believes in the practical application of the old adage: "All work and no play makes



(C. Western Electric Co.
Master Morty Gross listening to the radio which is amplified in each apartment in this new radio equipped apartment.

Jack a dull boy." He finds that the workers in the big boiler room of the Ritz perform their tasks with much more zest after intermissions or "recesses for radio."

The Ultimate Coupler—How to Make It

By Arthur S. Gordon

YOU will enjoy making the improved variocoupler described and illustrated in this article. It represents the very peak of variocoupler construction and embodies the theories which are found in the best instruments on the market. It is designed especially for concert work, but a bank-wound loading coil connected in series with the primary and the antenna will transform it into the finest multi-wave tuner you ever

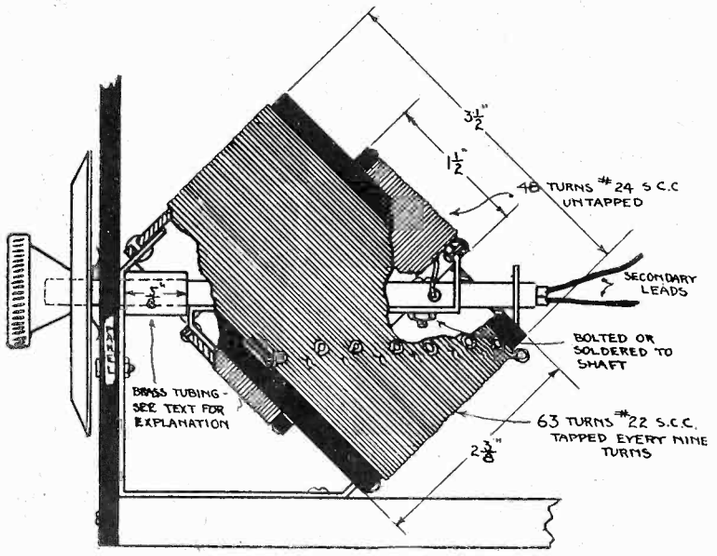


Fig. 1. Constructional details of the coupler described in the accompanying text. The secondary, or rotor, is fashioned to fit on a Z-shaped piece of metal allowing 180° variation, which is impossible with the present-day type.

saw. It was originally built for use in single or double-circuit regenerative receivers, but it may be used successfully in single or multitube reflex circuits, or in the reflex hook-up which employs a crystal as a detector.

The variocoupler has always been a favorite tuning device for both short and long wave reception. Usually there are two coils of wire in a variocoupler, one called the primary and the other called the secondary. The

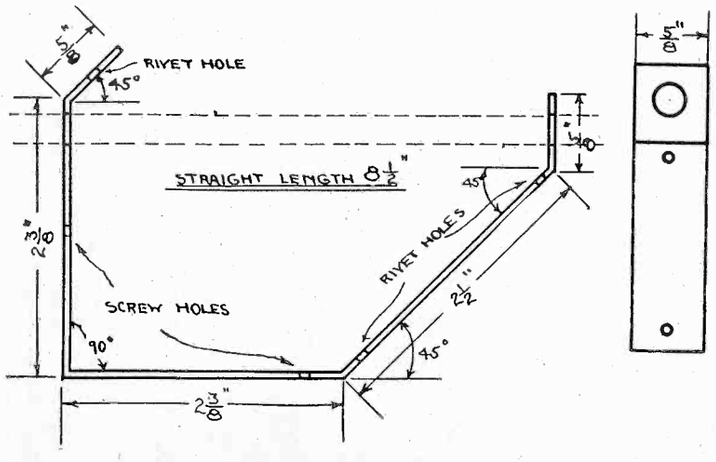


Fig. 2. The standard for the stationary coil is bent into shape from a strip of fairly heavy brass. It should be done very accurately if success is to be expected.

primary coil is stationary, is generally wound upon a tubular form, and is connected to the aerial-ground circuit as the main inductance. It carries the original current. The secondary coil is movable, is wound either on a tube or a ball, and is so placed with reference to the primary coil that a current is induced from one winding to the other. The amount of current so induced—or self-generated by the secondary on account of its nearness to the primary coil—is varied by moving the secondary in or out of the primary, as in a loose coupler, or by revolving the secondary in such a manner as to change the angle of its turns from zero to ninety degrees. This variable relationship of the two coils is known as coupling.

The particular instrument described here has the advantage of extreme coupling combined with the greatest amount of inductance. The movable coil is always in the center of the stationary coil, in which position it works best. The turns of the secondary are not divided on both sides of a spindle hole, as with most instruments. Above all, the construction of this Rolls Royce among couplers has been simplified so as to be within the mechanical skill of the average amateur. A glance at Fig. 1, which is an assembly view of the completed instrument, may disprove the preceding statement, but when it is considered that there is not a detail omitted from this assembly view, the preconception of difficulty disappears. In other words, Fig. 1 could be published without any text or detailed sketches, and a fair proportion of fans among us could build the instrument intact. However, a full explanation of how

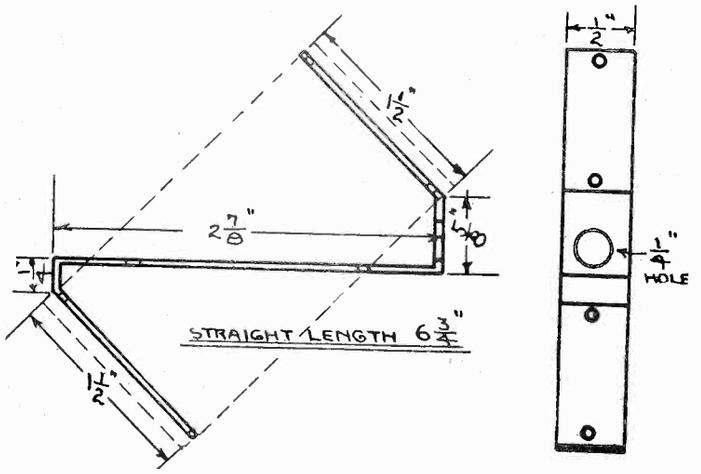


Fig. 3. The standard for the rotor which is bent out of heavy brass strip, and makes possible the 180° coupling.

to wind the coils, how to mount them and how to assemble them is given in the succeeding paragraphs.

The primary of this modern variocoupler is a stationary coil mounted at an angle of 45 degrees on a brass standard. This standard is fastened either to the back of the panel, to the baseboard, or to both, as shown in Fig. 1. The tube upon which the coil is wound may be either bakelite or cardboard. Bakelite is preferred on account of its higher insulating qualities and rigidity. The diameter is 3½ inches and the length 2⅜ inches. Sixty-three turns of No. 22 S. C. C. copper wire are about right for concert reception, with enough spare inductance to climb to 600 meters if desired.

There are no single taps on this coupler, eight turns being the closest to which the primary coil can be adjusted. Experience has demonstrated that while single taps on the primary of the coupler are sometimes needed, the majority of receivers work just as well without them. In other words, single wire taps are nice, but not exactly necessary. Close tuning is

(Continued on next page)

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done by coupling, and by use of the variable condenser. Should any one care to include single taps, however, the first nine turns are brought in succession to a switch, then every nine turns thereafter. Otherwise bring out a tap every nine turns, making seven in all.

Begin the winding about 3/8-inch from the edge of the tube. Twist the beginning of the wire into a loop, wrap the twisted portion with a single layer of tape or adhesive plaster, and bind the first turn to the coil by passing the succeeding turns over the ends of the tape. See Sketch 1 of Fig. 5. This idea originated with an English amateur who passes it on for approval.

The winding, however, is not started until the standard for the tube is made and riveted in place. This standard serves the triple purpose of holding the coil at its proper angle, providing the rotor shaft with bearings and giving the instrument a base on which to stand. A strip of fairly heavy brass 5/8-inch wide and 8½ inches long is bent carefully into the shape shown in Fig. 2. Three rivet holes are drilled as indicated, being placed so that the rivets will be on the outer

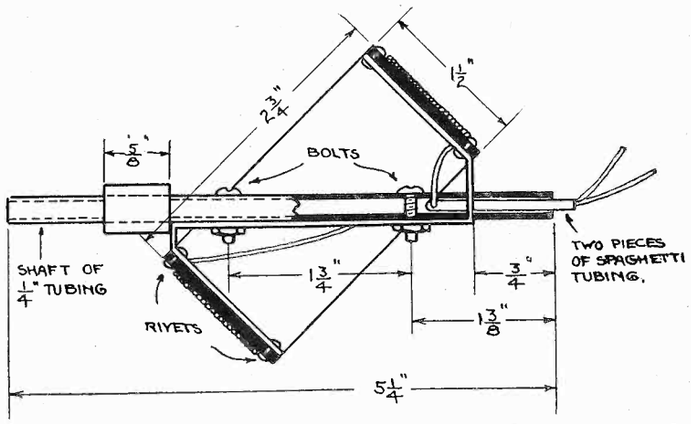


Fig. 4. Diagram showing the manner of fastening the coil on the standard. The shaft, which is hollow, is then bolted or soldered to the Z-shaped piece. This makes a solid looking and working rotor for the Ultimate Coupler.

margin of the coil and not so far toward the center as to interfere with winding. The screw holes are also drilled as shown.

In placing the two ¼-inch holes for the shaft, take pains to drill them so that the shaft is level. A slight inaccuracy here will make no great difference, however, as the inner coil is designed so as to allow a little leeway. In the interests of balanced operation, it is urged that more than usual care be taken.

For a detail of the rotor shaft, see Fig. 4. There it is shown to be, not a rod, but a brass or copper tube 5¼ inches long by ¼-inch outside diameter. It is drilled in four places. Two bolt holes are provided for small and thin bolts which are used to fasten the brass form on which the secondary coil is riveted, to the shaft. The details of this form, shaped like a letter Z, are given in Fig. 3. A strip of brass or copper 6¾ inches long by ½-inch wide is required. It is riveted to the inside of the secondary coils by four rivets, holes for which must be drilled beforehand. This Z shaped strip of brass is drilled with bolt holes to correspond with those on the shaft, and it is also drilled with a ¼-inch hole so that it will slip over the end of the shaft preliminary to bolting.

Of such a size as to slip over the rotor spindle is a short piece of larger brass tubing, 5/8-inch long. It is shown in Fig. 1 as a space washer between the upright leg of the primary standard and the forward end of the secondary form. This washer, or sleeve, plays a very important part in the mechanical—not the electrical—operation of the coupler. It cannot be dispensed with unless there is a shoulder on the rotor shaft so placed as to prevent the entire secondary element from moving forward. A movement in the other direction is prevented by the dial on the outside of the panel, with a spring placed between them to keep a necessary and convenient tension.

The secondary of this coupler is wound on a tube,

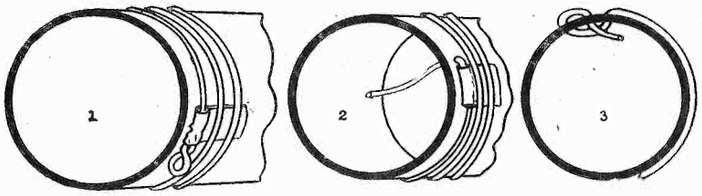


Fig. 5. Suggested method of fastening the first turn of the winding in order to prevent working loose. A strip of adhesive tape will do nicely.

rather than on a ball, 2¾ inches in diameter and 1½ inches long. Allowing ¼-inch margin along each edge, there is winding space for 48 turns of No. 24 S. C. C. copper wire. These turns are wound continuously and are not tapped. Suggestions for beginning and ending the winding are given in Fig. 5. Whether or not these suggestions are followed is of no importance, but be sure that both leads are brought inside the coils before calling the winding complete. For in order to give the secondary coil some freedom of motion, it is necessary to bring the leads out by way of the tubular shaft upon which the secondary is rotated.

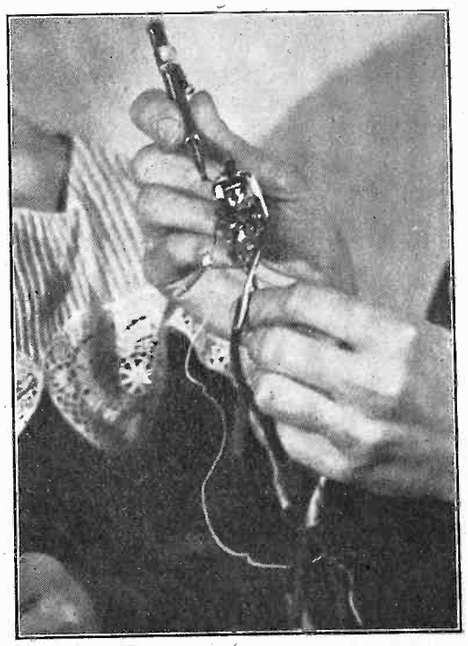
This is done by drilling two holes in the shaft to the rear of the second bolt. The holes should be about ⅛-inch in diameter, or large enough to permit the passage of spaghetti tubing. They enter the tube from opposite sides and only penetrate halfway. The spaghetti tubing is then forced into the holes and out through the shaft at the rear of the coupler. The leads are then put through the spaghetti insulation, and they come out as shown in both Fig. 1 and Fig. 4.

The assembly drawing does not show the seven-point switch needed for the primary of this coupler. Otherwise, however, it is complete, showing the mounting of the instrument as well as the manner of its operation. In using a variocoupler in connection with a regenerative set, many amateurs employ the primary as a tuning inductance and the secondary as a tickler or feed-back inductance. This particular instrument works at its best with such an arrangement, but it is also supremely well adapted to every use to which other, and not so modern, couplers may be put.

A HALF - INCH RADIO RECEIVER

A radio receiving set so small that it can be used to replace the jewel in a lady's hat pin has been built by Allen Turner, of Los Angeles, California. The illustration on the right shows a view of the receiver, whose small size can be appreciated by comparing it with the fountain pen held alongside of it.

(C. P. & A. Photos)



A Rectifier Made from Odds and Ends

By Ted C. Van Alstyne

FOR many people the stumbling block in radio is keeping the storage batteries charged. Lugging a forty or fifty pound battery to and from the garage is no easy task, especially if the garage is some distance away. Also, manufactured chargers come at high prices. The alternative then is to build your own rectifier to change the alternating current from the lighting circuit to a direct current to charge your battery.

An efficient rectifier can be made from odds and ends found in the cellar, dusted off and brought down from the attic or purchased at a figure within reach of all radio enthusiasts. If the instrument described in this article is carefully constructed it will be found adequate to charge a battery from which one or two bulbs are operated daily.

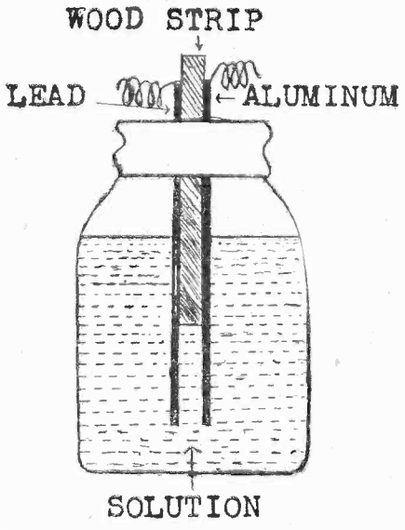


Fig. 1. Schematic drawing illustrating the method pursued in making up and arranging the elements of the rectifier.

First obtain from the top shelf in the pantry four wide-necked jars. The wider the tops the better. Fruit jars will do nicely. While you are in the pantry get the wife's supply of baking soda and bring it to the work bench. Cut from sheet aluminum four pieces six inches long and as wide as will go in the jars. About two inches will be the maximum width if fruit jars are used. Also make four pieces the same dimensions from sheet lead. If you have no lead, sheet iron or steel will do. It does not matter much about the thickness.

Screw one piece of aluminum and one piece of lead (iron or steel) to each side of a wooden separator ⅜-inch thick, four inches long and as wide as the metal elements, as shown inside the jar in Fig. 1. Make sure the screws do not go right through the wood and touch the other sheet of metal on the opposite side. The aluminum plates are the rectifying plates. The more surface exposed in the solution to follow, the more current will pass and thus charge your battery that much quicker. Small screws or nails driven into the edge of the separator at a point where they will rest on the edge of the container jar will keep the completed element in place and prevent a slipdown into the mixture.

Now obtain three quarts of distilled water. If you have no still and your neighbor is using his get it from a garage or a drug store. Saturate the water with the wife's baking soda. That is, add the soda until the water will not dissolve any more. An ammonium phosphate mixture is also good.

Next make a lamp bank from four ordinary electric bulbs and sockets. Old carbon bulbs discarded for their dimness or used in the cellar will be just as good as new ones. Fuse cut-outs will serve admirably for sockets if you have any on hand. This lamp bank is necessary to make up the resistance of the circuit so your new contrivance will not blow the fuses.

Connect a double-pole double-throw switch to your battery and rectifier, as shown in the complete hook-up in Fig. 2. This will facilitate a quick change-over from charging to ready for use. A snap switch will suffice for shutting off the alternating current power.

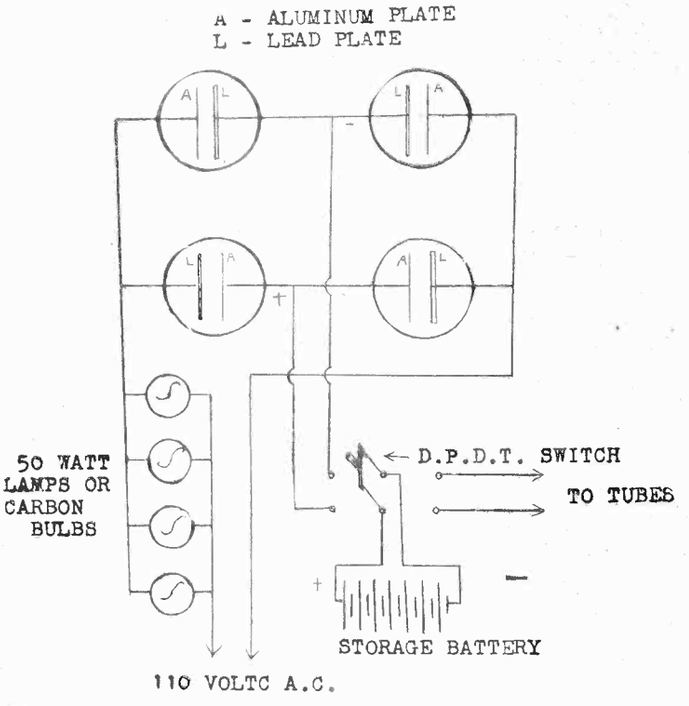


Fig. 2. Diagram showing how the rectifier should be hooked up, and also the method of connecting the series parallel bank of lamps.

The jars should be set in a tank about up to their necks in cold water to keep them cool. I used a cracker box of the well known tin variety. You will find that the jars heat a little when operated for a continuous period and the rectifying qualities diminish when this takes place, thus making the charging of your battery a slower process.

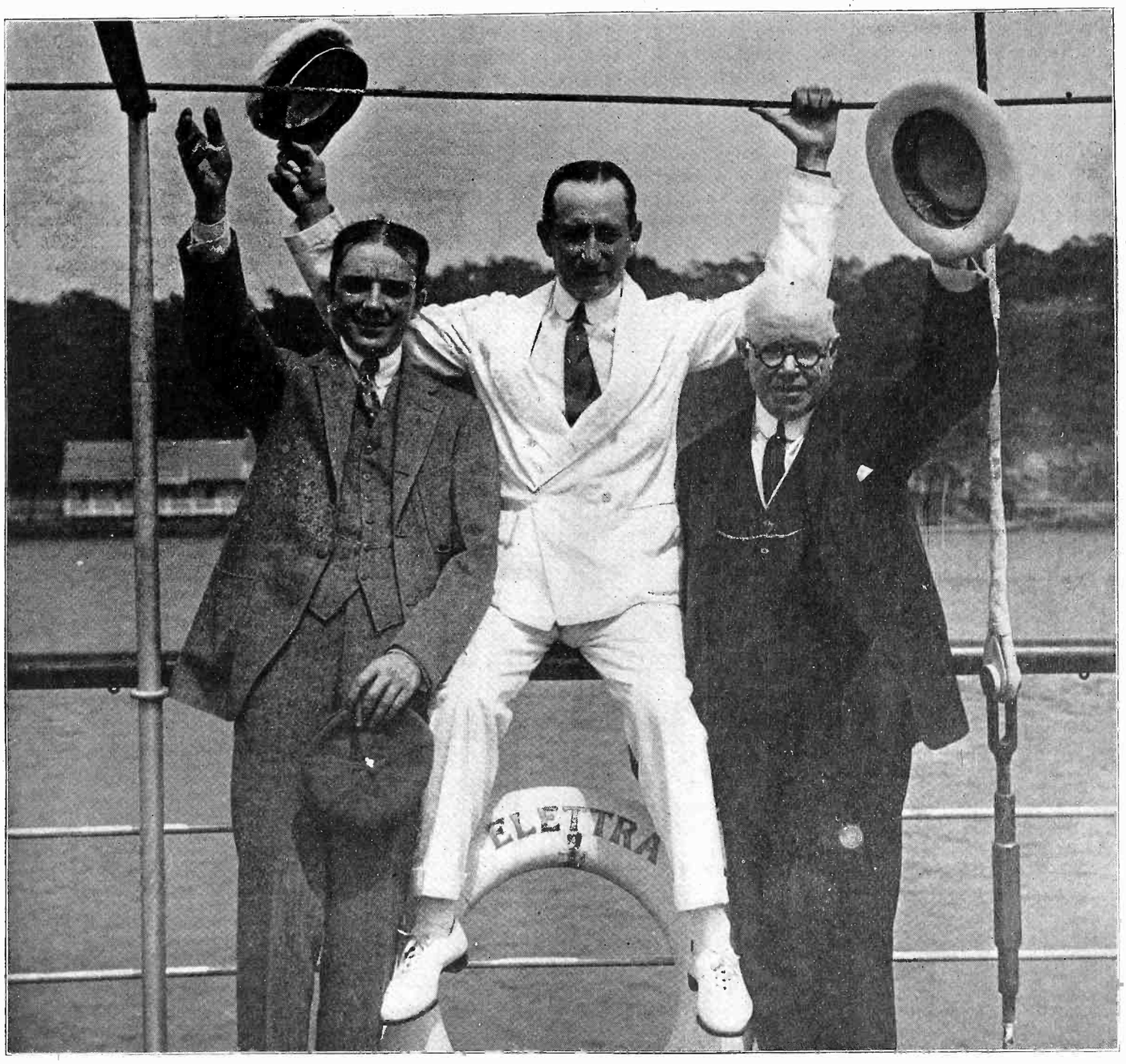
If the elements of each jar are connected with copper or brass ribbon and the cracker box given a coat of black enamel the finished instrument will have an attractive appearance.

When wiring the rectifier be sure the polarity is correct. Connect the aluminum plates through the change-over switch to the positive of the battery. The rectifier acts as a valve and allows the current to pass in one direction only—that is, from lead to aluminum plates.

Every two or three months empty out the solution and refill with fresh distilled water and a new supply of baking soda. Try the other chemical mentioned if you wish. You may find it necessary to replace the aluminum plates. Use only good metal. An alloy does not bring good results.

The weak spot in this type of charger is slowness,

Marconi Perfecting Wireless Directional Control



(C. Underwood and Underwood)

This picture shows three of the foremost radio men in the world—Senatore Guglielmo Marconi, Owen D. Young and E. J. Nally—on the deck of Marconi's yacht, "Elettra." This photograph was taken on the occasion of Marconi's visit to Dr. Steinmetz, the famous electrical authority, and is one of the few photographs snapped of the wireless wizard when he was not working.

RADIO enthusiasts all over the country were greatly interested in the announcement from London last week that William Marconi, the eminent wireless pioneer, is confident of the successful development of a method of wireless directional control with which he has been experimenting. The inventor was quoted as saying that he hoped soon to perfect a device by which radio messages would be received only by the person or station for whom they are intended.

Mr. Marconi will conduct further experiments during April on his yacht "Elettra" off the coast of Spain, where he will receive messages from the station at Carnarvon, Wales.

It is understood in London that the device under development somewhat resembles receiving instruments by means of which stations are enabled to locate within a fraction of a second of arc the point of origin of the waves carrying messages.

"If my new device is successful, as regards controlling the air waves which carry messages, it will prevent waves spreading as they do now," Mr. Marconi is quoted as saying. "I can't go into details about it as yet. I hope it may be practical to regulate air waves, even as far as across the Atlantic. On my trip I am going south so as to be near port, instead of in mid-ocean, and we will try our tests on the far countries."

If the experiments are successful they will revolutionize existing radio so that messages will be received only by the station toward which they are directed.

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Iowa	26	Montana	5	Oregon	16
Indiana	15	North Dakota	5		
Colorado	15	Tennessee	5		
Michigan	14	Utah	5		
Minnesota	14	Rhode Island	4		
New Jersey	13	South Dakota	4		
Wisconsin	11	Wyoming	4		
Florida	11	North Carolina	4		
Georgia	10	Virginia	4		
Massachusetts	10	Delaware	3		
District of Columbia	9	Hawaii	3		
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Connecticut	7	West Virginia	3		
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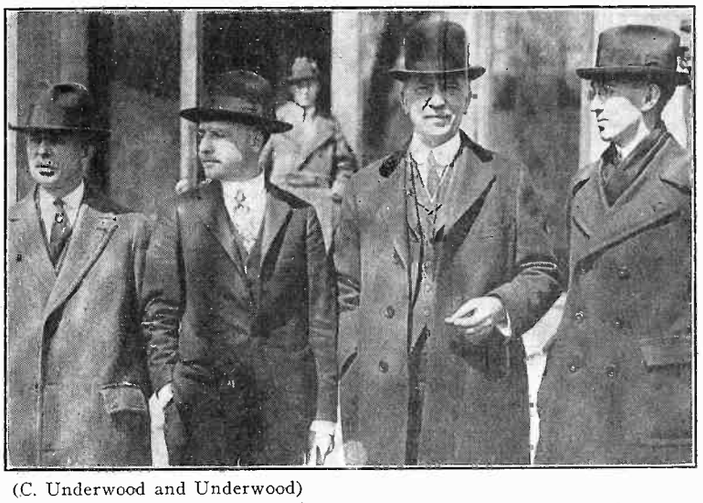

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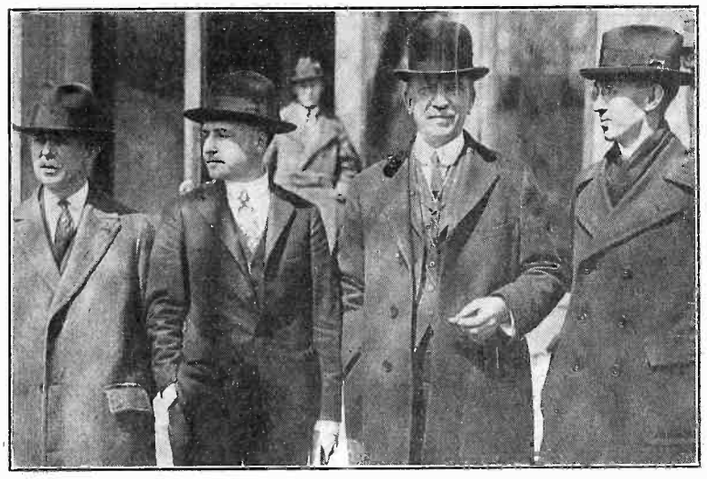

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The Radio Primer

For Thousands of Beginners Who Are Coming Into Radio Circles

Weekly A B C of Radio Facts and Principles Fully and Clearly Explained

By Lynn Brooks

IN the construction of single-circuit sets, what are some of the points of caution to be observed in order to make sure of the efficient operation of the circuit?

In the construction of the single-circuit set, which is the simplest circuit for the uninitiated constructor, the following precautions should be observed: The leads should be soldered for the best efficiency. Short leads should be used rather than strictly right-angle connections. The leads from the tube, such as the grid leak lead and plate lead, should all be made separately, and not tapped onto one another. The leads from the tickler should be made correctly, as the circuit will not function properly otherwise.

* * *

Is there any advantage to be gained by the use of double-circuit jacks in a set that comprises more than one tube?

The advantage gained by the little extra work in connecting up a double-circuit jack in a set that comprises more than a single tube is that there is no chance for any current being dissipated through leakage in the primary of the transformer. It also has the advantage of preventing any trouble arising from current leaking, as before stated, and setting up a back feed which might cause squeals and howls that would be objectionable.

* * *

Is a filament rheostat absolutely necessary in the use of the 1½-volt tubes?

This is a question that has been asked many times because of the fact that the tube takes 1½ volts and the dry cells are meant to furnish 1½ volts. While the 1½-volt tubes will, and do, take 1½ volts, they will often work more efficiently on much less, frequently taking not more than one-quarter of the actual voltage rating for their efficient operation. It is therefore absolutely necessary, for the correct functioning of the tube, to provide a rheostat for the control of the filament current.

* * *

Why is it possible to hear a squeal in a non-oscillating set when tuning in stations where they are nearly on the same wave length?

This is due to the fact that the two carrier waves of the transmitters conflict with each other, producing a "beat" note, which is audible. It is the same in basic principle as hetrodyning a non-regenerative set through the agency of a nearby oscillator.

* * *

Is the squealing above mentioned preventable?

This cannot be prevented because of the fact that, even though the set is not oscillating, the beat note will be audible, as explained before, and also because a set which does not produce oscillations of its own accord is not as sharp in tuning as one that oscillates.

* * *

When a receiver squeals over a wide scale without a station being heard, what is the trouble?

When this squeal occurs it indicates that the tube is being forced, and the following should be done: The filament current should be reduced; there should be less B battery used, and occasionally the trouble will be eliminated by varying the grid leak. Either lessening or increasing the resistance in the grid leak for each particular tube often stops this squeal.

* * *

In the use of some tubes microphonic noises are often heard, some to such an extent that it is unpleasant. Mention some ways of preventing this.

These microphonic noises, which are due to vibrations of the elements inside the tube, can be eliminated in the following manner: The tube socket should be mounted on heavy, thick felt, or very soft rubber, and no direct connection, such as screws, should hold the base of the socket to the base on which it is mounted. Another method is to mount the sockets on a sub-panel, which is suspended on springs, or strips of thick rubber, so that any vibrations will not be transmitted to the tube itself.

* * *

What is the correct position for the mounting of a tube? Does the position have anything to do with its operation?

In the mounting of tube sockets relative to the position of the filament the following should be observed: The tube should be mounted in such a manner that the filament is vertical. The reason for this is that, if the filament is mounted horizontally, it will sag, due to the heat expanding the filament, and in time will touch one of the other elements, which will short it. The position in which a tube is mounted has nothing to do with its operation. It is simply a matter of the care of the tube that it should be mounted as above outlined.

* * *

Is there any method of renewing the life of a tube after it has been shorted other than having it repaired?

A tube which is blown cannot be repaired, as can a light bulb, by tapping on the glass and fusing the ends of the filament together because of the fact that the filament is short and is stretched on holders that tend to keep it tight. When it is burnt out it is useless to attempt to renew it. Have a new filament put in.

* * *

What are "long-armed controls"?

"Long-armed controls" is a coined term to designate an extension on the tuning controls, generally a long piece of hard rubber tubing, which will allow the various controls to be manipulated without the necessity of bringing the body of the operator near enough to the set to allow the body to have the capacity effect.

* * *

Which is the best of the three methods of eliminating body capacity?

In the long run, it will be found that the shielding of the panel will give the most satisfaction, although the other methods outlined last week may be successfully employed. The shielding, however, will absolutely prevent any capacity effect being felt at all, while there is always the liability of the other methods not being efficacious enough to eliminate it entirely. This, of course, can be determined only by actual experiment.

* * *

Will the shielding of the panel eliminate the capacity effect felt in the phone circuit when the phone cords are grasped?

The capacity effect noticeable in the phone circuit cannot be eliminated by shielding the panel, and as a matter of fact it is almost impossible to eliminate it. This effect is noticed only when the body is very near the cords themselves. If the phone cords are left lying on the operating table without being held or moved away from the body, the capacity will remain constant and the capacity effect will not be noticed except when the arm or hand lies on top of the cords.

Radio and the Woman

By Crystal D. Tector

THE doctor who lives next door to us has finally been invoked into the Radio Clan. And it really was funny how long he held off and what reasons he had for delaying the purchase of his set. He said that the constant listening-in was harmful to the ears, as it strained the nerves. But his wife, who by the way, is the president of our Matinee Club, kept after him for so long that he finally got a little bit of a crystal set, and had it two days, when he went down to New York one afternoon and ordered a set direct from the manufacturer. And now F. H. is jealous of it because it is more up to date than ours, but I say, "We'll let our Flewelling alone for a while, until you get up ambition enough to make one for yourself. I'm not going to let another manufactured set into this house until you show me that you can do as well as I did with mine." And that ends it.

* * *

I have been impressed so deeply and so often lately by the remarkable influence of radio on the country as a whole, that I have begun to take the indications of its far-reaching effects on the average person as a matter of course, and as the inevitable result of its widespread appeal and scientific worth. But when I accepted the invitation of a friend of mine to have dinner at her home recently, I little expected at the time that I was to witness again a specific instance of the happiness and contentment that radio brings into many homes.

My friend's mother is blind. The full significance of such an affliction cannot possibly be realized by those who are fortunate enough to be blessed with unimpaired sight. The ordinary pleasures, such as the movies, the theatre, the daily newspaper and books, are denied those who have lost their sight. But now we have radio.

No more need for those who are afflicted with blindness to sit through the long days in darkness. Radio has opened up the world to their sightless eyes through the medium of forgetfulness and the enjoyment born of "listening in." As I walked into the living room of my friend's home, the first thing to attract and hold my attention was the sight of a kindly, gentle little lady, sitting in her armchair, with a smile of contentment on her face. On her ears were a pair of phones. As I entered, she reached over to the radio set on the table by her chair, "tuned out," and greeted me in a manner more cheerful than I had ever noticed in her before.

"My dear," she said, "there are a great many things in life that seem unbearable at times. Until recently, I thought that blindness was one of them. But since Alice bought me this radio set, and taught me how to 'tune in' on the world, I think I have found at least partial compensation for the loss of my sight."

And before the evening was over, I knew by her animated conversation and the expression of happiness on her face that radio had made one more conquest; had brought joy and gladness into one more home, and I left with a still stronger feeling of thankfulness for the service it renders those whose lives previously had been lived in the shadows.

* * *

A friend of ours recently visited us, and upon seeing that we had a radio set told us that Billie, her son, had been bothering her to allow him to install one, but that she was afraid that it would be dangerous. "You know that with all those big stations sending, I thought that it would shock him, and probably kill him, poor dear." Well, I just laughed out so loud that she was very indignant, but when I explained that there was less danger of getting hurt from radio than there was in crossing 42nd street and Broadway at four o'clock in the morning, she sort of smiled weakly and in such a way that said, "Well that may be so, but I don't believe it." So I went into a long discourse and told her all about the way in which it was done, and I believe that she was convinced. You can just imagine my surprise when Billie called me up and told me to come over and "see the wonderful set Ma bought me for getting a good report card." Well, I thought that I was pretty good when I sold a booth at the county fair, but I think that I can pin a medal on my "Sunday go to meetin'" suit for that. The idea of anybody being afraid of anything these days. Why, I don't have a ground switch on our set, being confident in the lightning arrester that I have installed.

* * *

I ran in to see Ye Editor last week and he told me that my next contribution would be for RADIO WORLD'S birthday. Just think of it, folks, it's one year old this week and still growing better and better every day. I know that I am simply tickled to death, and the fact that he said that he was going to put a Special Dress on our magazine just made me leap with ecstacy. And the ads. Why, I never even saw anything like it. And to think that I am a part of it all!

Blind—Makes Own Receiver

(C. Keystone View Co.)

Clemens C. Niemeyer, of St. Paul, Minn., although blind, is not in the least handicapped. Being an ardent fan, he not only built his own set, but made three others for friends. He is fifty-eight years old, a piano tuner by trade and spends his spare time making sets and listening in. He winds the coils himself, and does everything, even to making the cabinets, which is in itself a job that a whole lot of amateurs would not tackle.

The Neutrodyne Circuit Receiver

By Kimball Houton Stark

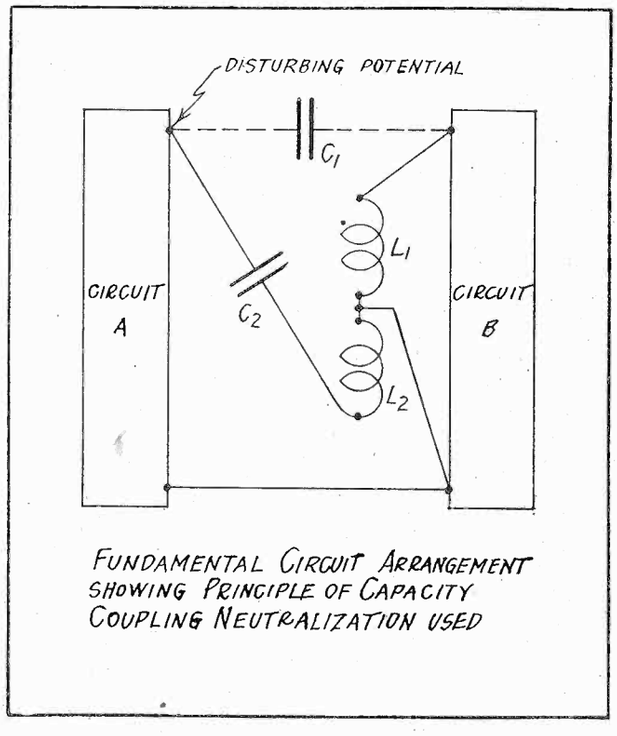
Chief Engineer, F. A. D. Andrea, Inc.

POSSIBLY the newest development in radio is the neutrodyne circuit invented and developed by Professor L. A. Hazeltine, professor of Electrical Engineering, at Stevens Institute of Technology, Hoboken, N. J.

Professor Hazeltine recently disclosed his circuits before a meeting of the Radio Club of America at Columbia University, New York City.

The object of the neutrodyne circuit is the neutralization of the capacity coupling between two or more portions of a given circuit. When used for the improvement of radio receiver circuits it eliminates the capacity coupling existing between plate and grid, thus preventing regeneration. This condition of neutralization is brought about by the adjustment of specially designed condensers placed in the circuit.

The fundamental circuit illustrating the neutrodyne principle is shown in Fig. 1. In the diagram, circuits A and B are coupled through the direct connection at the bottom and through the coupling capacity C1. To neutralize this capacity coupling two closely coupled

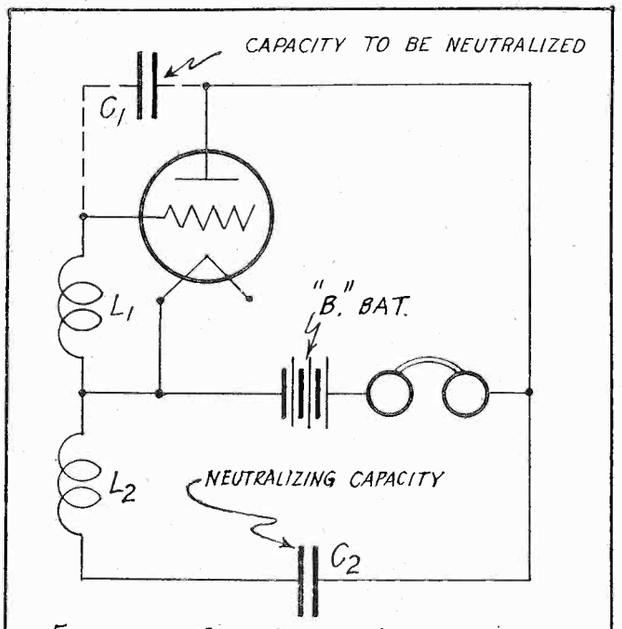


FUNDAMENTAL CIRCUIT ARRANGEMENT SHOWING PRINCIPLE OF CAPACITY COUPLING NEUTRALIZATION USED

inductances L1 and L2 and the neutralizing capacity C2, are arranged as shown, L1 being connected between one terminal on C1 and the common connection, and L2 being being connected in series with C2, between the other terminal on C1, and the common connection. Terminals of L1 and L2 which are connected together are of unlike polarity. If circuit A has a source of alternating current, the alternating potential at its upper terminal (marked disturbing potential) will send a current through C1 to circuit B, which current in flowing through the impedance of circuit B, will set up a voltage between the terminals of this circuit, power thus being transferred from A to B.

Now if the neutralizing circuit L1, L2 and C2 be introduced and so adjusted that the current through L1 magnetically balances the current through L2, no voltage will exist across either of these coils nor across circuit B, which is the condition desired to eliminate the transfer of energy.

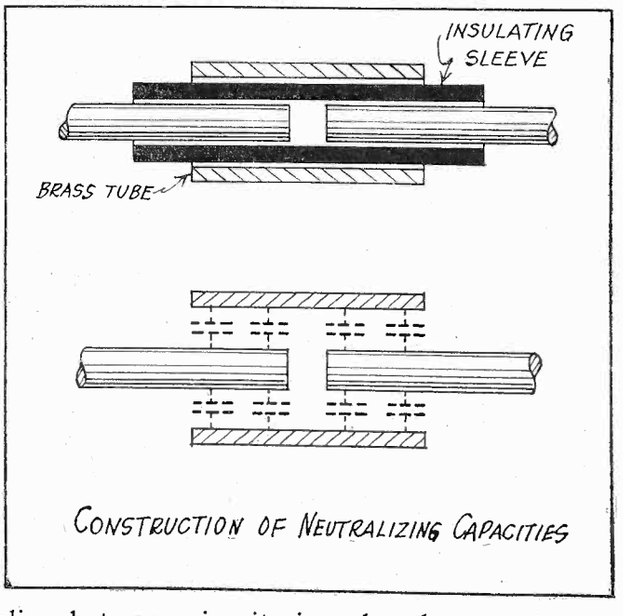
As directly applied to vacuum tube circuits, Fig. 2 illustrates the application. In this figure, the capacity C2, being correctly adjusted, neutralizes the grid-plate capacity, represented by C1.



FUNDAMENTAL TUBE CIRCUIT ARRANGEMENT

In actual practice inductance coils L1 and L2 may be respectively the primary and secondary inductances of air core radio frequency transformers. The secondaries of these transformers are preferably tuned by variable air condensers. A distinct advantage of the neutrodyne circuit is the fact that radio frequency transformers may be employed having a step-up ratio of windings of the order of one to four.

The adjustable neutralizing capacity in both Figs. 1 and 2 is designated as C2. In actual practice this capacity is adjusted in such a manner that the capacity



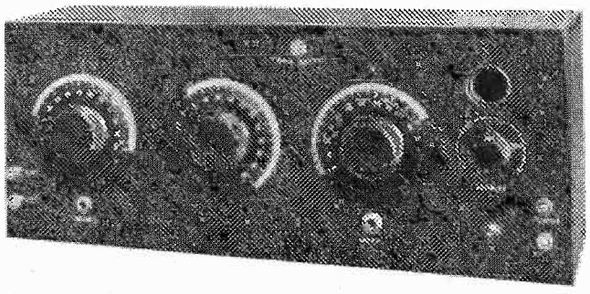
CONSTRUCTION OF NEUTRALIZING CAPACITIES

coupling between circuits is reduced to a minimum, if not to zero. The neutralizing capacity may have a capacitance of from 1 to 5 or 6 micro-micro-farads.

(*Continued on following page*)

(Continued from preceding page)

Such a very small adjustable condenser is unusual even in radio. A condenser of this kind may be readily constructed as shown by the drawings in Fig. 3. It consists of an insulated sleeve in which are inserted two pieces of wire with about ⅛ inch space between them at the center. A metal tube is then adjusted lengthwise from the ends of the two wires, the resultant capacity being the series capacity of the metal tube and both wires. During tests this neutralizing capacity is adjusted and then sealed.



In making this initial adjustment, the receiver circuits are tuned to a strong buzzer signal, the filament of the tube whose capacity is to be neutralized is turned out, but the tube left in its socket. When the neutralizing capacity is properly adjusted under these conditions there will be no capacity coupling on either side of the tube and no buzzer signals will be transferred. If the tube, however, is taken out of the socket altogether signals will come in strong, being again neutralized when the tube is placed in contact with the grid and plate contact springs.

Such a method of adjustment illustrates that the neutrodyne circuit operates to eliminate capacity coupling and is not just a method for opposing the effects of regeneration, because the adjustment is made with the filament cold, and therefore, under conditions when the tube could have no regeneration.

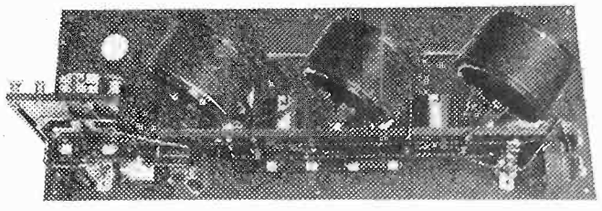
controls. Three of these are large dials for tuning control and the fourth knob is that of a vernier rheostat for the detector tube. A switch is shown at the lower right hand end of the panel for tuning on and off the filament current to all tubes.

In the interior view, Fig. 5, the radio frequency transformer units are shown mounted at such an angle to each other that no transfer of electro-magnetic coupling can take place. The neutralizing or balancing capacities are shown above and between the transformer units.

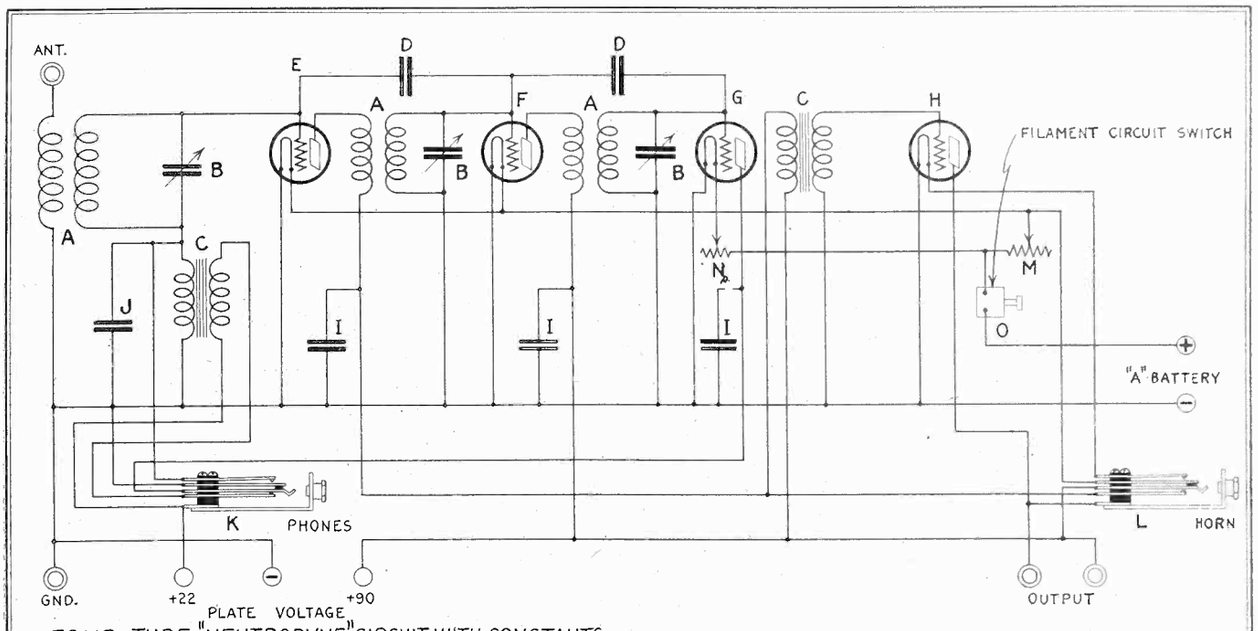
Fig. 6 shows a complete schematic wiring diagram of the receivers illustrated in Figs. 4 and 5. The table of constants beneath the wiring diagram will explain the various parts of the circuit. This circuit using only four tubes actually does the work of five tubes as the first tube is used as both a radio and audio frequency amplifier.

It seems to be human nature for every one who owns any kind of a radio receiver to want to pull in long distance signals. To get stations a thousand miles away isn't enough, and we are continually staying up nights twisting dial after dial in an effort to bring in that station 1,500 or 2,000 miles away.

From this point of view receivers utilizing the neu-



trodyne circuit are certainly ideal. There being only three simple adjustments, nearly any one can learn to operate the receiver in a few moments and with exceptional results. In such a receiver, there being no regeneration and no re-radiation, obviously there will be no squealing and howling and interference will not be caused in passing over various carrier waves.



FOUR TUBE "NEUTRODYNE" CIRCUIT WITH CONSTANTS

A AIR CORE RADIO FREQUENCY TRANSFORMERS
B VARIABLE AIR CONDENSERS 0.0004 MFD.
C IRON CORE AUDIO FREQUENCY TRANSFORMERS
D ADJUSTABLE NEUTRALIZING CAPACITIES 1-5 MICRO-MFD.
E REFLEXED AUDIO & RADIO FREQUENCY AMPLIFIER TUBE
F SECOND RADIO FREQUENCY AMPLIFIER TUBE
G DETECTOR TUBE
H PURE AUDIO FREQUENCY AMPLIFIER TUBE
J BY-PASS CONDENSER 0.0001 MFD.
K SPECIAL TELEPHONE JACK FOR PHONES
L " " " " LOUD SPEAKER
M POWER RHEOSTAT FOR AMPLIFIER TUBES
N RADIO FREQUENCY BY-PASS CONDENSER 0.001 MFD.
N VERNIER FILAMENT RHEOSTAT FOR DETECTOR TUBE
O FILAMENT CIRCUIT SWITCH

Figs. 4 and 5 show respectively exterior and interior views of a neutrodyne receiver being manufactured at the present time.

The front view of the panal in Fig. 4 shows only four

It will be found when a station is actually tuned in

(Continued on page 22)

Radiograms

It is rumored that the French Line will equip all its passenger ships sailing out of New York with radio receivers and amplifiers for the reception of broadcast programs.

* * *

For the second time in a fortnight American concerts were heard in France when Paris wireless amateurs last week listened in on the Wanamaker organ recital broadcast from Philadelphia.

* * *

In January, 1921, a transcontinental amateur record of 6½ minutes for sending a radio message across the United States and return was established. Efforts to eclipse this record across Canada, from Montreal, P. Q., to Vancouver, B. C., will be made by amateurs this week.

* * *

Jane Cowl's interpretation of Juliet was broadcast one night last week across the entire country from Henry Miller's Theatre, New York City, where Miss Cowl is beginning her third month in "Romeo and Juliet." She gave the entire first act of Shakespeare's tragic love story to the United States by radio.

* * *

Free medical advice via wireless to Swedish ships at sea will be given on demand from leading hospitals in Stockholm and Gothenburg, providing the Swedish Government grants the request of the Department of Telegraphs to transmit such advice without cost. Sweden will be the first country in Europe to inagurate this kind of service, already tried out in this country.

* * *

Many thousands throughout the South who "listened in" on Atlanta, Ga., on a recent night learned something of the magnitude of the automobile industry directly from the lips of C. W. Nash, president of the Nash Motors Company. Mr. Nash spoke from the office of the Atlanta Journal. It was pointed out that in value of finished product the automobile industry ranks first in America, exceeding by a generous margin even the gigantic steel and textile industries.

* * *

The Monte Grande wireless station near Buenos Aires, Argentina, the first South American station in the international commercial radio system, is almost completed. It will begin service some time next summer. Argentina will then be placed in direct wireless communication with the United States for the first time, as well as with Europe. It is said that there are two strange, static "dead areas"—one near the equator off Brazil, and one in the South Atlantic—which only a station equipped like that at Monte Grand can overcome. The new station has been built entirely with American materials.

* * *

Before long a complete radio installation may be expected with every one of those homes on which you pay down all you could save in a lifetime and then face four mortgages. Already several builders around New York have held forth this added inducement to quit the noisy city and live in our better radio circles, observes the New York "Times." The experienced suburbanite who goes forth to look at a house no longer asks how far it is to school, whether city improvements have been made and what days the trains do not run. Instead, he talks about aerials, antennae, ground connections and all the other things that one has to have or do when he takes up radio.

A $1,200,000 real estate deal was completed by radio last week after E. Clifford Potter, cruising in the Mediterranean aboard the "Adriatic," had "sat in" with his colleagues in discussions of the deal in New York City.

* * *

Steel cages no longer prevent inmates of the Allegheny County Jail at Pittsburgh from enjoying the entertainments of the outside world. Warden Edward Lewis has installed a radio set, by which they nightly take "radio trips" to the various broadcasting stations.

* * *

A nation-wide survey by the Broadcasting Committee of the National Radio Chamber of Commerce discloses that "congestion of radio communication has increased to such an extent that the value of this medium to the public is seriously endangered by the resulting interference."

* * *

The Newspaper Proprietors' Association and the Newspaper Society in the British Isles have notified the Radio Broadcasting Company that no radio programs will hereafter be inserted unless paid for at regular rates. The broadcasting company replied that it would not use advertising space to announce its programs.

* * *

A report of the recent Firpo-Brennan prize fight by rounds was transmitted directly from a New York City broadcasting station and picked up at Saavedra, near Buenos Ayres, and was relayed by telephone to the newspapers in the city. It is claimed this was the first time that radio communication between the United States and Argentina was established successfully.

* * *

Receipt by the State Department of a report by the Commission of Jurists which met at The Hague last December is now followed by an announcement by Secretary Hughes that the Government might initiate action looking toward a treaty or a convention among various nations based upon the report as it affects rules of international law applying to radio and aircraft.

* * *

Just as radio is becoming so popular a new type of crook, the radio burglar shows up, taking the place of the sneak thief who a few years ago grew rich by gaining access to homes on the pretext that he was a telephone repair man. This is the assertion of the chief investigator for the burglary department of a New York casualty company, in issuing a warning to amateur radio fans not to admit to their homes radio repair men unless they can show credentials.

* * *

The medical profession has often been reproached with conservatism, but this tendency has not prevented the growing use of radio apparatus in the hospital, says Dr. Albert S. Hyman, of the Mount Sinai Hospital, Philadelphia, writing in "Hospital Management." It is Dr. Hyman's belief that radio equipment has a distinct and beneficial use in hospitals, particularly in those dedicated to the relief and convalescence of chronically ill patients, and to institutions situated afar from the large centers of population. The problem of keeping such patients interested in other things besides themselves, he says, is one which hospital administrators and others have pondered for many years. Occupational therapy, systematic exercises, physiotherapy, and allied fields are essentially devices for removing the patient from himself. To these has now been added radio.

(*Continued from page* 21)

that Dials 2 and 3 will read nearly the same, Dial 1 varying in setting with various antennae used.

Once a station is logged and notations made of the settings of all three dials the same station can be listened to at any later time by simply readjusting the dials to the given setting.

Some of the broadcasting stations heard from New York using only a 50-foot indoor antenna around the picture moulding of a fourth floor apartment are noted below together with dial settings. This reception was on the evening of March 8, 1923.

STATIONS HEARD FROM NEW YORK ON RECEIVER USING HAZELTINE'S NEUTRODYNE CIRCUIT

	Stations	Dial 1	Dial 2	Dial 3	Time P.M.
WBZ	Memphis, Tenn.....	40	67	66	9:35
WOO	Philadelphia, Pa.....	36	63	62	9:35-10
WEAF	New York, N. Y.....	30	56	57	9:35-20
WGY	Schenectady, N. Y.....	23	49	48	9:35-30
WJZ	Newark, N. J.....	10	42	41	9:35-40
WHB	Kansas City, Mo.....	31.2	60	59	10:50
WGM	Atlanta, Ga.....	38.2	65	64	10:56
CFCA	Toronto, Canada.....	47.2	72.2	71.2	11:00
WLAG	Minneapolis, Minn.....	38	58	57	11:15
WAAP	Wichita, Kan.....	20	52.2	51	11:30
WHN	New York, N. Y.....	19	47	45	11:45 A.M.
WSB	Atlanta, Ga.....	35	62	61	12:02
WDAP	Chicago, Ill.....	17	48	47	12:12
WDAJ	College Pt., Ga.....	17	45	44	12:15
WLW	Cincinnati, Ohio.....	38	41	40	12:17
WDAF	Kansas City, Mo.....	32	63	62	12:35
WSD	St. Louis, Mo.....	27	57.2	56	12:52
KFI	Los Angeles, Cal.....	49	71.3	70	....

WGY, Schenectady, N. Y., was received without aerial or ground and with very good intensity on a simple loud speaker.

Surely any receiver as simple to operate, which does not cause interference by re-radiation and which has the ability to bring in long distance stations such as are shown above, is an ideal receiver.

Hardly a day goes by that enthusiastic letters are not received from all over the country telling of exceptional results obtained with this circuit—results that did not require an expert to obtain.

A Low Power C. W. Transmitter

By C. White, Consulting Engineer

WELL do I remember in the early days of radio when the owner of a vacuum tube was looked upon by his fellow fans as a sort of a "tin god." It so happened that one of these few "tin gods" lived in the next block and this particular fellow was an old chum of mine. We had both followed the science as closely as possible since in those days radio magazines were rather strange and unheard-of things. After the war we decided to carry on some experiments in radiophone which had been rather abruptly cut off. The first experiment was to develope a small transmitter. The transmitter was nothing more than a regenerative receiver with a microphone in the Ant.-Gnd. circuit. After much effort the set was so adjusted that radiophone messages could be sent from his house and received in mine on an ordinary crystal receiver I had always used for my code reception.

Amongst the C. W. amateurs the five-watt single tube transmitter is no doubt the most popular type. This type has won favor and its undisputed position owing to the fact that it is simple and extremely efficient. Its simplicity lies in the fact that no separate tube is used for modulation and its efficiency is due to the fact that it can be overloaded to a great extent without harm. In addition to these advantages it is extremely compact and when once correctly designed it works with the minimum number of controls. Of course, there are many types of tuning circuits that can be used with five-watt transmitters. The coupled circuit type and the single circuit type, or a sort of combination type, are most used. Then again, they can be classified in regard to style of modulation—direct carrier modulation, indirect carrier modulation, and direct buzzer modulation. Direct carrier modulation consists in placing the microphone in series with output of the oscillator and by talking into the microphone the resistance from aerial to ground is accordingly varied and hence the amplitudes of the carrier waves radiated from the antennae are functions of the microphone resistance. Such a method is not so very satisfactory since it is next to impossible to secure a good degree of variation in carrier wave amplitude. It is simple and effective in producing a rather pure modulation but poor in efficiency because only a relatively small audio-frequency is impressed upon the oscillator output. The indirect method makes use of a modulation transformer which serves a double purpose. This transformer not only steps up the audio-frequency voltage variations, but also acts as a filter in preventing the direct current flowing in the microphone circuit from associating with any of the currents in the oscillator. The advantages of this method of modulation are better control of the audio-waves through the variation of the direct current flowing through the microphone and more complete modulation of the carrier since this type of control is afforded.

In Fig. 1 is illustrated a simple type of single tube transmitter. The tuning inductance L is nothing more than the old double slider tuning coil type which is familiar to all and easily purchased or constructed. The condenser C-1 is a 23-plate air variable, C-2 is a .00025 micro-farad mica, and C-3 is a telephone type of condenser whose correct value of capacity will depend upon the make of modulation transformer employed. The amateur builder can easily ascertain the correct value to use by writing or inquiring of the manufacturer of the transformer. A condenser of .25 mfd. is quite often employed but sometimes smaller or larger ones are better with certain transformers. Likewise the value of grid leak will have to be determined by trial since each particular tube has a certain value of grid leak resistance at which it functions very much better than at any other value. The potentiometer P should have a resistance of 250 ohms and by its use it is possible to impress the correct potential on the grid of the tube, thus securing the point of maximum efficiency. The modulation transformer is so connected in the circuit that its output varies the impressed voltage on the grid of the tube, thus varying the amplitude of the oscillations being generated. If the amplitude of the voltage varied on the grid by means of the output from the modulating transformer be excessive the same will not only react to change the amplitude, but will also seriously disturb the oscillating balance of the transmitter and hence alter the wave-length of the

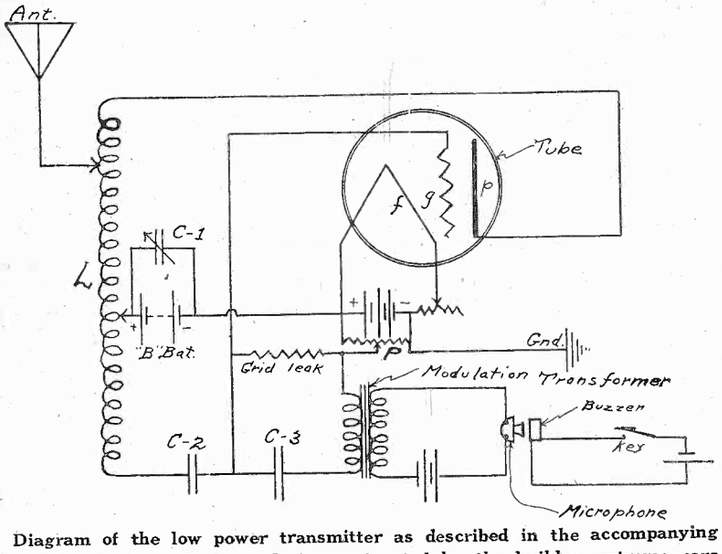


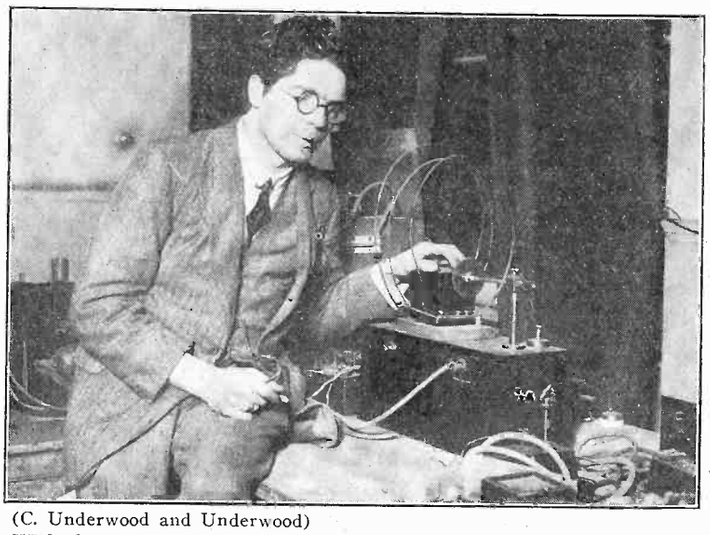
Diagram of the low power transmitter as described in the accompanying article. If the inductance L is constructed by the builder, extreme care should be taken in winding. Wire smaller than No. 22 should not be used. If a 5-watt tube is used larger wire should be used.

carrier wave in addition. Naturally this condition of affairs is quite undesirable, for the carrier wave frequency must not be altered by the modulating apparatus other than to the extent of the upper and lower side-bands. Such trouble is often removed by reducing the voltage of the battery in the microphone circuit.

In order to be able to transmit code when desired, a small high pitch buzzer should be included in the station equipment. By placing the buzzer close to the mouthpiece it is possible to transmit a clear characteristic note. If so desired greater modulation can be obtained when sending code by connecting the buzzer contacts in place of the micro-phone terminals, but the set is more flexible as illustrated. For local work the set can be used as a radiophone and for distant work buzzer modulated signals can be sent out over space. Of course, it is highly imperative to operate the set with a high plate voltage. The tube must be slightly overloaded in this regard in order to get good efficiency. Indicating instruments are a great aid in obtaining consistent results night after night. With but little experience the operator can easily tell if something has gone wrong with his outfit. A hot wire ammeter in series with the antennae and a similar type of ammeter in series with the plate of the tube will greatly aid the operator.

Radio World Begins Its Interesting Pictorial Arr

Captions by Ro

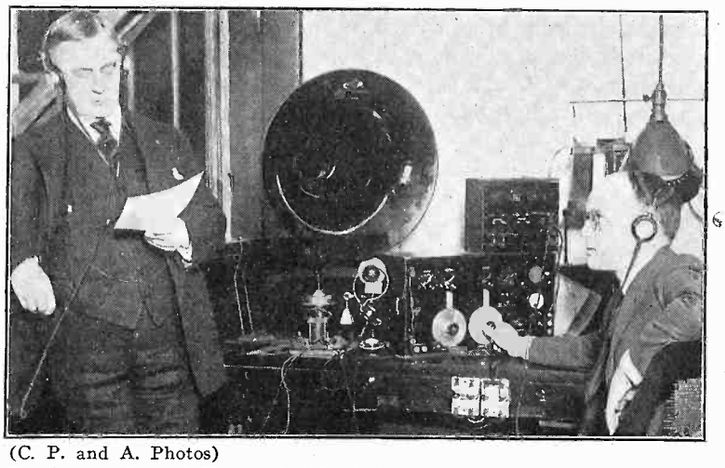


(C. Underwood and Underwood)

With the establishment of broadcasting stations throughout Great Britain many of the model makers have turned their thoughts and efforts to radio, and find in it a marvelous field for experimentation, just as the American amateur has for the past few years. The above illustration shows an interesting phase which has been taken up by Professor Low.

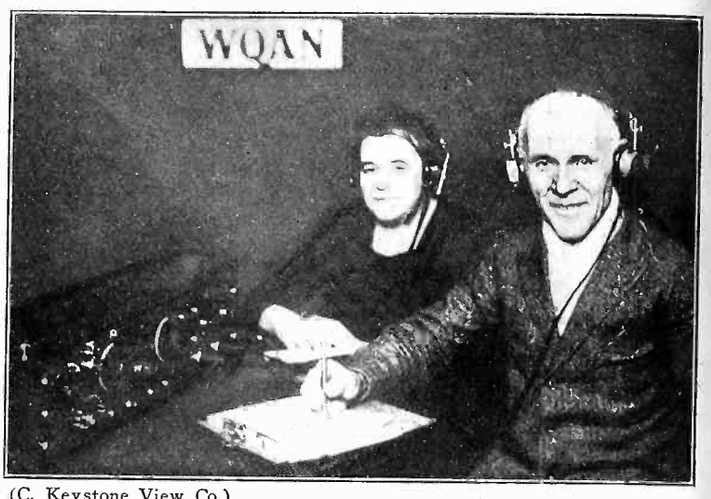
(C. International Newsreel Photo)

Mrs. Edward M. Munzer, of Hewlett, Long Island, who enjoys the distinction of being the only woman radio engineer in the world. Mrs. Munzer is a graduate of the Massachusetts Institute of Technology, with the degree of Chemical Engineer. The above illustration shows her in her laboratory.



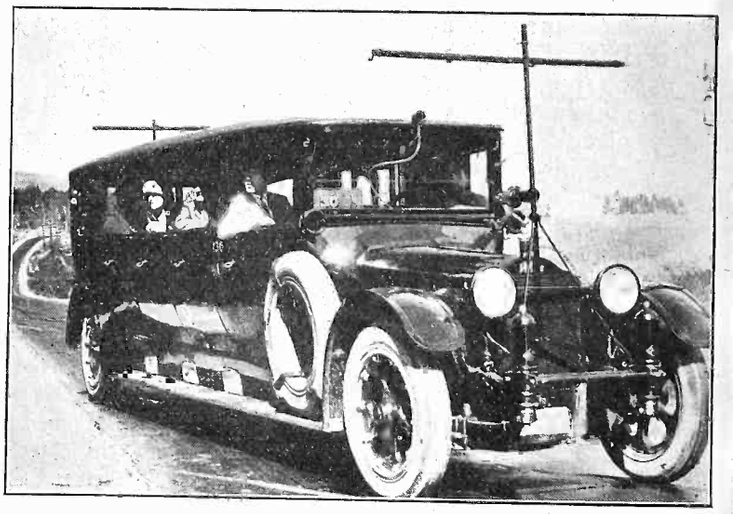
(C. P. and A. Photos)

Postmaster General New and Colonel Henderson, Second Assistant Postmaster General, receiving daily reports on their radio set from the Post Office Department.



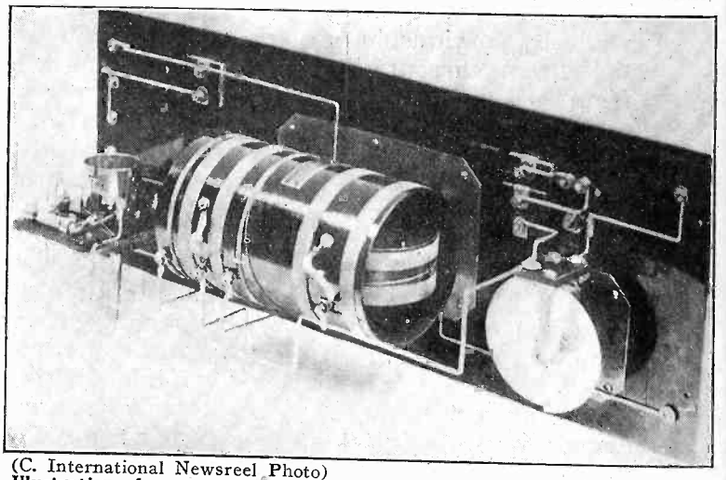
(C. Keystone View Co.)

After half a century of deafness, John Finnerty, pictured above, was enabled to hear for the first time by the aid of radio. He asserts it was one of the most exciting experiences of his life. Although it was at first seemingly impossible, Mr. Finnerty was able to distinguish between voice and music. His wife, who also is deaf, underwent the same test, but was unable to detect any tangible sound.



(C. Gilliams Service)

W. E. Travis, president of the California Transit Company, Oakland, Calif., recently sent out the first radio equipped bus on its regular run to Sacramento, and the passengers were enabled by means of the powerful receiving set which has been installed as part of the equipment, to enjoy the radio concerts broadcast from the powerful Los Angeles stations.



(C. International Newsreel Photo)

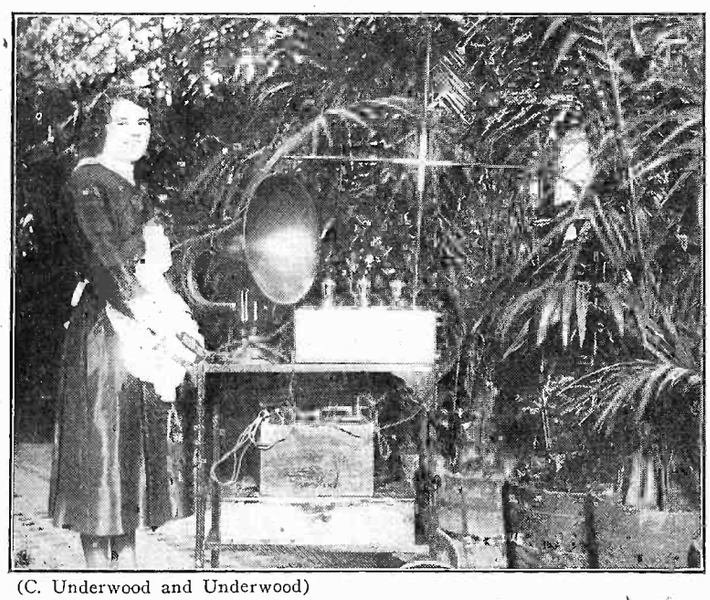
Illustration of a new receiver which has been perfected by V. M. Moen, St. Paul, Minn., and which is extremely flexible and sensitive. The feature of this circuit is the combined variometer unit shown which is composed of two rotors which take the place of the two variometers and variocoupler in the regular regenerative circuit.

hird Volume With This
y Caught By the Camera

rt L. Dougherty

(C. Underwood and Underwood)

"Uncle Robert," who devotes his life to making things easier for the blind and otherwise unfortunately disabled, holding three-year-old Evelyn Kriloff, while she listens to the radio concert. Uncle Robert has done much to cheer the disabled.

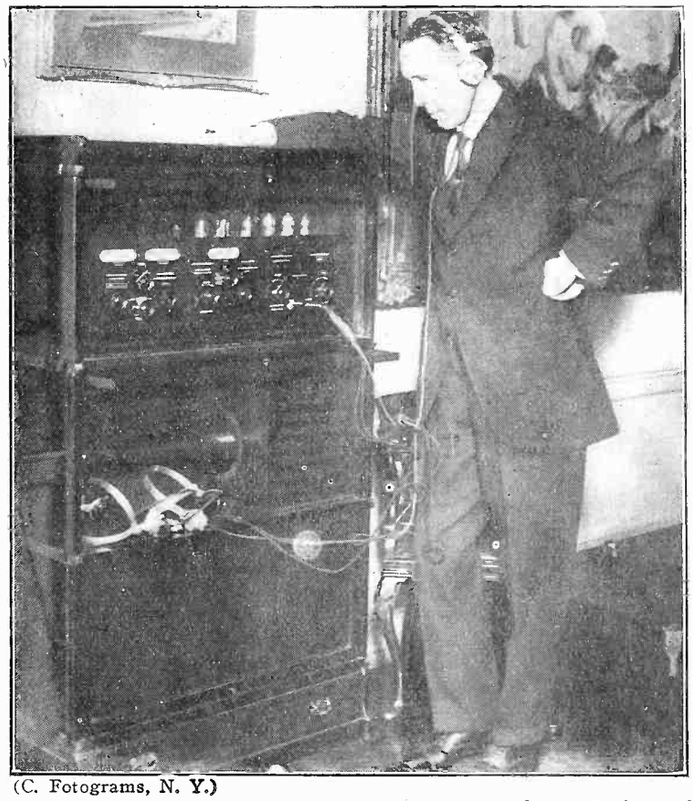


(C. Underwood and Underwood)

The way they do it in the modern conservatory, as shown at the Third Annual Radio Convention, held at the Hotel Pennsylvania. The set is complete in itself, using a loop antenna and a loud speaker in conjunction with a powerful receiver.

(C. Kadel and Herbert)

William Henderson and his super-heterodyne receiver which he constructed after school hours. The receiver is of the eight-tube type and he has succeeded in picking up stations 2,500 miles away on the loud speaker, an accomplishment that is wonderful in itself.



(C. Fotograms, N. Y.)

Sir Gerald Du Maurier, noted English actor, is an ardent radio fan and has located his receiver in a sectional bookcase, so that it will be kept dust-proof when it is not in use. The set shown is of British manufacture and utilizes seven tubes. He has done some remarkable work with it.

(C. International Newsreel Photo)

An illustration showing that the United States is not the only place where radio is popular. A London family is here shown listening in to a play at the Hippodrome, just as the American fans listen in to opera.

Answers to Readers

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The sketch you enclose is quite correct with one exception. The tubes preferably should be arranged in the following manner: Instead of detector, radio frequency amplifier, audio frequency amplifier, it would save wiring trouble and time if you arranged the sockets and wired them as radio frequency amplifier, detector and then audio frequency amplifier. This method will save lots of space, as you will then be running your wires in correct continuity with the phases in which the current travels through the circuit.

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Where can I obtain a hook-up of the flivver set described in RADIO WORLD*?—Richard Jenkinson, 264 Liberty street, Paterson, N. J.*

If you will write to the Permanent Radio Fair, Hotel Imperial, New York City, you will be able to get the information you seek.

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You will not notice any appreciable increase in the strength of the signals when you use radio frequency, but a noticeable increase in the clearness of signals will be noted if you have the circuit hooked up properly. The use of radio frequency increases the distance, but not the strength so much. It clears up the signals appreciably.

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1. *Kindly publish hook-up for the following: Variocoupler, condensers, W-D 11 tube, variable grid leak, etc.*

2. *Does it matter which lead from the rotor goes to the plate?*

3. *In the hook-up where could I place a 23-plate condenser to the best advantage? —Earle Vanderlick, 1920 West Broadway, Minneapolis, Minn.*

1. We refer you to the hook-up published on page 20 of RADIO WORLD for March 17, 1923. The two condensers are used in the places marked, while the one across the rotor is optional, meaning that it can be used if found convenient.

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Kindly tell me of a method of decreasing the clicking interference caused by a pole-changer located in a telephone office near my receiver. Have tried using condensers. —Henry M. Willard, New Berlin, N. Y.

If you refer to RADIO WORLD for January 20, 1923, you will find the method of eliminating interference described on page 20 in answer to an inquiry very much the same as yours.

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When you are using a loop antenna you do not need a ground. That is one of the advantages of the loop antenna. It is connected directly across the circuit in place of the secondary of the tuner, and the tuning is done by means of a condenser in parallel with it. Don't try to get a ground, as it is not necessary. We advise using at least one step of radio frequency with this type of receiver, especially as you intend to use it on a car.

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1. *Can slate be used successfully for radio panels?*

2. *Would sections cut from a phonograph record be of use for a panel?*

3. *What plate voltage should be used on a detector and two-stage amplifier set using W-D 11 tubes?*

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2. You can use the composition of which records are made if you wish. It makes a good insulator for panels, but is extremely brittle. Care has to be taken when drilling and working it.

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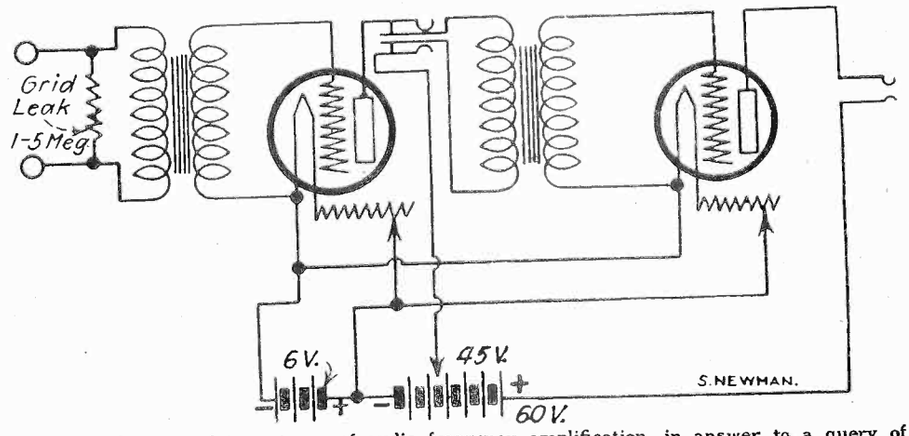
The hook-up you request is published herewith.



Schematic diagram of two stages of audio frequency amplification, in answer to a query of R. O. Cooke. The grid leak across the primary of the first transformer gives easier control of the high frequency squeal, which otherwise might prove troublesome.

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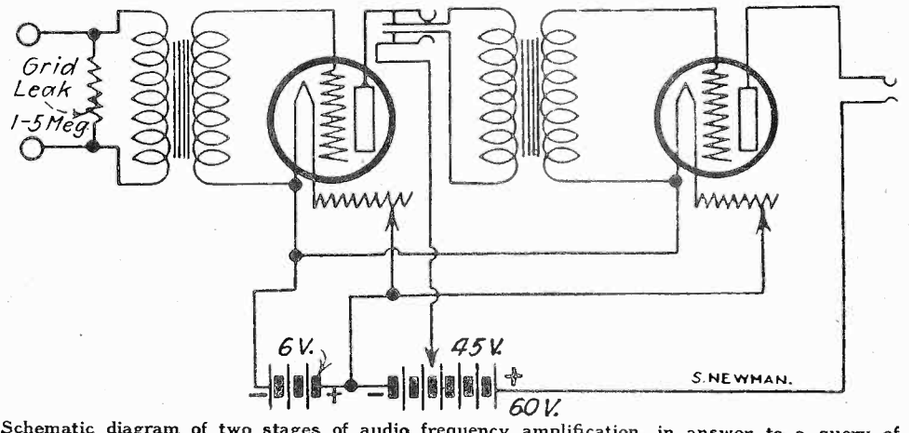

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MAGNAVOX Radio
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Factors Which Affect Selectivity

By W. S. Thompson, E. E.

WITH broadcasting conditions as they are today, a receiving set that is very selective is of the utmost value and is practically a necessity. By definition, selectivity is the ability to tune in one of the many transmitting stations and tune out all others. This is very difficult when two or more transmitting stations are sending at exactly the same wave length and are equally distant from the receiver. However, the broadcasting stations of today usually differ in wave length from two to fifty meters, so by constructing the receiving set along the lines of best design it will acquire the characteristic called selectivity.

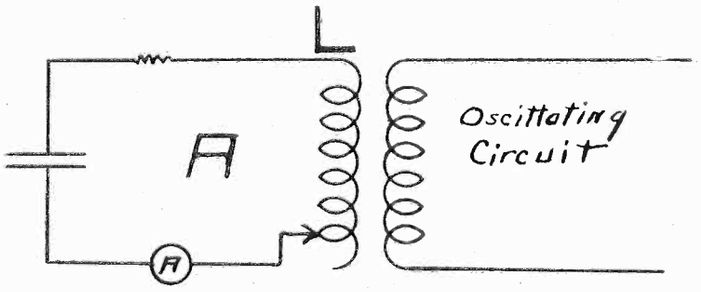


Fig. 1. Illustration depicting tuned primary circuit of a simple set, with ammeter in circuit to show current flow. This is the simplest type of oscillatory circuit.

In order to show the effect of different factors upon selectivity, the author has performed the experiments discussed below and has given reproductions of the graphs plotted from the data taken during these experiments. The resonance curves given are curves in which distances above the horizontal axis represent certain amounts of current, and distances to the right of the vertical axis represent wave lengths to which the circuit in question is tuned. Thus, by plotting change of current against change of inductance, the curves show at a glance how a given change of inductance will affect the current.

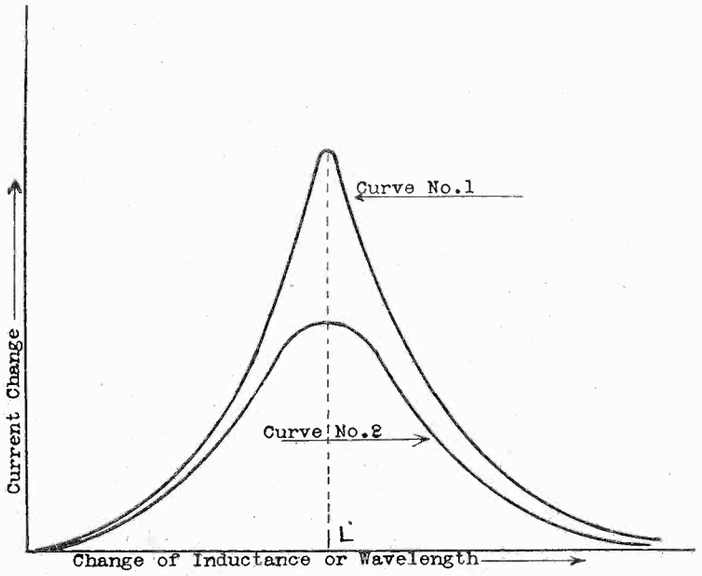


Fig. 2. Curve plotted to show current change as inductance is changed in the circuit.

One of the most important factors in making a set selective is to have a minimum resistance in the circuits making up the set. This is accomplished by using a large size copper wire for connecting all apparatus and by carefully soldering all connections. Any loose connections and any small size wire introduces resistance, the effect of which will be shown. In order to illustrate the effect of resistance on the selectivity of tuning we will take the case of an antenna circuit consisting of capacitance and inductance. Fig. 1 is the equivalent circuit of a tuned primary circuit of a simple set with an ammeter introduced to show the current flow in this part of the apparatus, which is coupled to an oscillating circuit as shown. The oscillations in this generator circuit are of a definite wave length corresponding to a transmitting station. As the value of the inductance L is changed from minimum to maximum the deflection of the ammeter rises to a maximum value and then decreases to a low value as shown by the resonance curve 1 in Fig. 2. When the inductance L is at a value L, the current flow is a maximum so we say that circuit "A" is tuned to the same wave length as the oscillating circuit. Curve 1 has a sharp peak at the top which shows if we either increase or decrease the value of the inductance L a very small amount

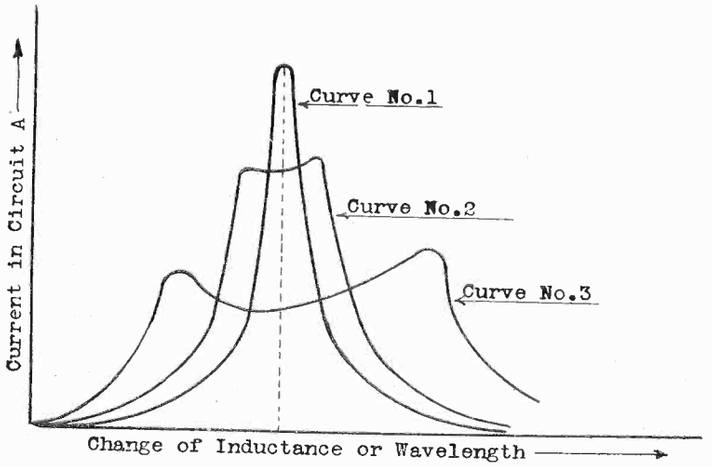


Fig. 3. Three curves plotted for three different values of coupling, showing the difference in the peak of the wave when close, medium, or loose coupling is used.

the current will fall to a much lower value. This means that if there is a sharp peak on the resonance curve of a circuit and there was a telephone receiver circuit in place of the ammeter, that a small change of the inductance would cause the induced current to fall to such a low value that there would be no response in the phones, showing that the response to a given transmitter is only on a very small portion of the variable inductance and the circuit is said to be selective. Now suppose that there was a high resistance in this circuit and again the circuit was tuned as before. The value of current shown by the ammeter would follow the resonance Curve 2 of Fig. 2. From this curve we can see that a small change of the inductance L would not affect the value of the current to any great extent. That is, if there was a telephone receiver circuit in place of the ammeter, the intensity of the sound would not change for a small change of L hence the curve shows that the addition of resistance broadens the tuning to a very marked extent because a very large change of L would be necessary to tune out any transmitting station. This discussion of resistance broadening tuning applies to all circuits of every type of receiving set, so the importance of large bus-bar connec-

(*Continued on following page*)

(*Continued from preceding page*)

tions and soldering cannot be too strongly emphasized.

Another very important factor affecting selectivity is the coupling between circuits. In this discussion Fig. 1 will represent a secondary circuit "A" coupled to an oscillating antenna circuit as shown. The ammeter will take the place of a crystal and telephone receivers in order to show exactly the values of current induced in this circuit by the coupled primary. The procedure in conducting this test was to set the coupling as tight as possible and then tune circuit "A" taking values of current for different settings of the inductance "L" as in the preceding experiment. This procedure was repeated for three different values of coupling; that is, for very close, medium and loose coupling, giving the three curves shown in Fig. 3. Curve 1 represents the resonance curve with loose coupling, showing the sharp peak which is the characteristic of a very selective circuit. Curve 2 is the resonance curve for the close coupling and has a rather flat top showing that with this coupling a considerable change of inductance L would be necessary to change the intensity of signals. Curve 3, that of the very close coupling, has two distinct peaks, showing that the circuit will respond to the same transmitter at two different settings of the inductance. This would be a very bad state of affairs in a receiving set, for it would be almost impossible to separate two stations if they were sending on wave lengths nearly the same. From these curves the conclusion must be drawn that by loosely coupling the circuits of a receiving set, selectivity will be gained. However, advocates of closely coupled circuits, claim that loosely coupled circuits always greatly reduce the signal strength. The fallacy of this argument will be shown by the following procedure: Circuit "A" was tuned to give maximum response as shown by the ammeter and then the coil "L" was removed far enough away from the corresponding coil of the oscillating circuit until there was no response in the circuit "A." Then coil "L" was moved toward the oscillating circuit coil until the coupling was very close. The current in circuit "A" as read from the ammeter, followed the curve in Fig. 4, showing that the current increased as the coupling was tightened, until a certain degree of coupling was reached after which any further tightening of the coupling decreased the response. This clearly shows that very close coupling does not give the maximum signal strength. The explanation of this phenomenon is that when the coupling is very close the secondary circuit gives back part of its induced energy to the primary, hence weakening the current in the secondary.

Fig. 4 also shows that if the coupling is loosened beyond the point which gives maximum response, the intensity of the signal strength will decrease. This property may be made use of in a very interesting way. By referring to Fig. 5, the solid lines represent the resonance curves of Circuit "A," Fig. 1, for two different wave lengths, corresponding to two different transmitting stations sending at the same time. The line "I" represents the value of current necessary to give a response in telephone receivers, and as these two resonance curves overlap above this value of current, there will be interference between these two stations. That is, both stations will cause a response in the receivers at the same time. However, if we loosen the coupling between the two circuits, until the response in the secondary circuit is less, the two dotted resonance curves will then represent the response to these two stations. As the two dotted curves do not overlap above the critical current of the telephone receivers, there will be no interference between these two stations. As the two dotted curves do not overlap above the critical current of the telephone receivers, there will be no interference between these two stations, so that one and only one will be heard.

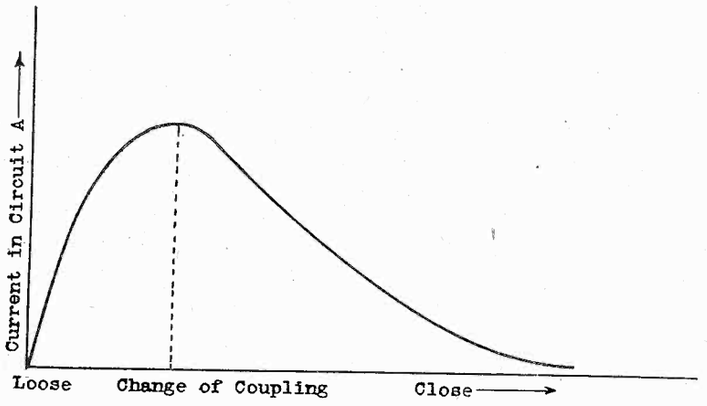


Fig. 4. Showing how, if the coupling is loosened beyond a certain point, the response of the signal suddenly decreases.

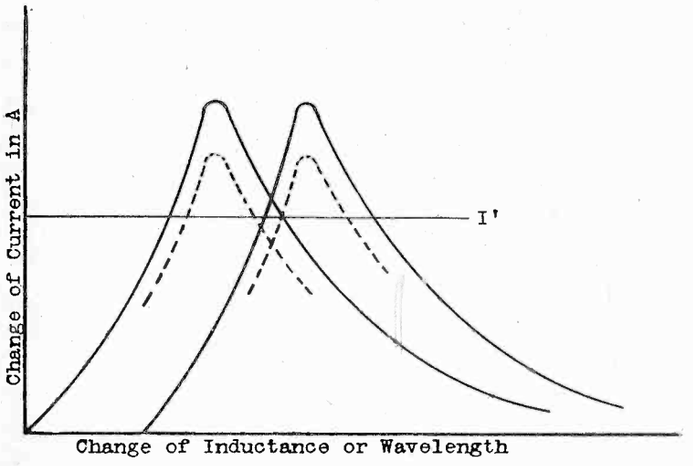


Fig. 5. Resonance curves representing two different waves corresponding to different stations sending at one time.

Seven New Broadcasters on 360 Meters

THE supplemental list of limited commercial broadcasting stations licensed during the week ending March 17 follows:

Call	Station	Power
KQP	Apple City Radio Club, Hood River, Oregon	10 watts
KFHB	Boardwell, P. L., Hood River, Oregon	10 watts
KFFV	Graceland College, Lamoni, Iowa	250 watts
KFDZ	Iverson, Harry O., Minneapolis, Minn.	5 watts
KDZQ	Pyle & Nichols, Denver Colorado	100 watts
WRAH	Read, Stanley N., Providence, R. I.	10 watts
KFDY	South Dakota State College of Agri. & Mech. Arts, Brookings, S. D.	100 watts

A Year of Radio Progress

March, 1922, to March, 1923

March 29, 1922. First Issue of RADIO WORLD.

Second Annual Radio Show

Armstrong's super-regenerative and super-heterodyne circuits perfected. A marvelous step in the progress of super-sensitive receivers.

Photographs sent by radio from Italy to the United States. The first invention of its kind to send pictures through the ether.

KDKA First radio broadcasting station to be heard in Iquique, Chile, South America, and the first broadcasting station to establish a record distance for long distance program broadcasting.

Marconi makes a flying visit to the United States to confer with Steinmetz and other electrical and radio experts.

Dr. Irving Languir perfects a 20 kilowatt vacuum tube, the most powerful ever made.

The 1½ volt tube perfected.

First opera broadcast over the country.

Amateurs of United States and France establish communication on low waves and low power, breaking all records for distance over low wave lengths.

Dr. Lee de Forest confers with foreign scientists and perfects talking motion pictures.

World Series baseball games broadcast for the first time.

Football games broadcast over land wires and re-broadcast over radio, combing the two successfully for the first time.

National Radio Week proclaimed and celebrated—the most successful public week ever held in behalf of an industry. Big boom in the radio field.

First successful two-way communication—the annual meeting of the Westinghouse stockholders in Chicago and New York 1,000 miles apart. Perfect co-ordination was maintained through the agency of two-way communication via radio.

The White Bill, for the control of radio passed by the House and killed in the Senate.

Broadcasting stations heard and reported in both England and France, breaking all previous records for continuous program reception and transmission.

Several popular plays broadcast directly from the stage of the theatres in which they were given.

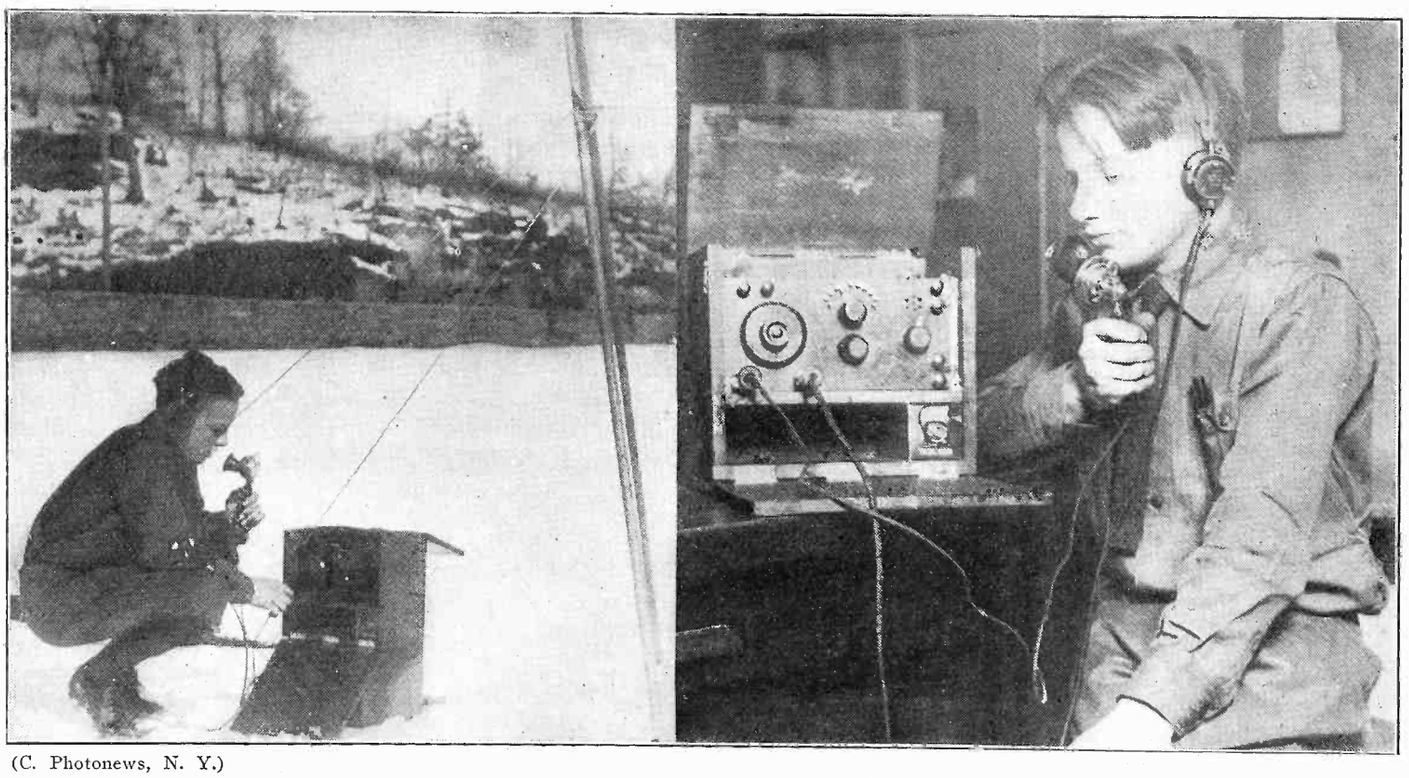
Third Annual Convention of the Second Radio District. A wonderful success.

General Harbord assumes presidency of the Radio Corporation of America.

Station at Rocky Point, Long Island, which will make the United States the center of all radio communication, brought to a point of perfection. Marks a marvelous undertaking in radio.

March, 1923, RADIO WORLD begins its second year of useful service.

Boy Scouts Active in Radio



(C. Photonews, N. Y.)

Little has been said or written about the Boy Scouts' activities in the field of radio. Nevertheless, ever since the days of 5 kw Coffins and crude galena detectors constructed out of odd pieces of material found lying around, the Boy Scouts of America have always been interested in the science.

Lately much notice has been given to the activities of the Scouts when camping out, and the illustration above shows one of the portable outfits that was built by Troop 501, of New York City.

The outfit pictured is a combined receiver and short distance transmitter, working on the same tube. It was built by the members of the troop and can be used either as a receiver or transmitter by plugging in either the receivers or the microphone. One of the illustrations shows a near view of the set, while the other depicts the set in actual operation while out on a hike, using a portable antenna which is part of the outfit. The set is self-contained, being operated on batteries carried in a separate compartment, which fits under the set proper.

Radio Regulation in Cuba

PENDING the passage of a law to cover the use of radio telegraph in Cuba a presidential decree has been issued defining the various classes of non-governmental radio stations and prescribing certain general rules for their operation, says Acting Commercial Attaché P. L. Edwards in a report to the Department of Commerce. Up to the present time there has been no law or regulation covering the construction or operation of radio stations in Cuba.

Under the decree non-governmental radio stations are divided into five classes—A, B, C, D and E—to each of which is assigned a wave length and a maximum power. No sets of any of these classes will be used for commercial purposes. Classification is as follows:

Class	Wave length (meters)	Maximum power (kilowatts)
A*—Amateurs	200	½
B —Educational Institutions, experimenters.	225-275	½
C —Colleges, state institutions in general	300-360	½
D —State institutions only	400	½ to 1
E —Meteorological stations only	485	½ to 1

*All receiving sets are rated Class A, regardless of type or size.

All owners of stations coming within any of these five classes must register with the Director General of Communication before a stated date. After that date no station may be used unless the proper permit has been issued by the office mentioned. The permits are for a term of one year in the case of classes A, B and C, and for five years in the other two classes. Applicants must pass an elementary examination, but it is not believed that this requirement will in any way hamper the issuance of licenses. The decree further provides that the government may, under specified circumstances, require transmitting stations of any of the five classes to cease operation without claiming indemnity from the government. Transmitting stations of any class are made subject to the regulations of the International Radio Convention, signed in London in 1912. The decree also prohibits the transmitting of the international distress call, S.O.S., either as a special signal or in the course of any general text. Penalties are provided for the disclosure of any public or government message intercepted by any station. Only apparatus capable of transmitting a continuous wave may be used.

Transmission Poor

Physics Professor—"Does any one know anything about violet rays?"

Stude—"I do, but I promised not to give her away."—*Chaparral.*

Radio World Begins Volume III

WITH this issue RADIO WORLD begins its second year of useful service.

It is doubtful if, in the history of the publishing business, an empty niche has been occupied with such satisfaction to readers, advertisers and the publishers as in this instance.

Our readers have demonstrated positively and concretely that they get what they want in our columns. Our volume of sales from newsstands is surprising even to us.

The increase of business secured by our advertisers has been decidedly profitable to them—and they have told us so.

RADIO WORLD will continue to give, week by week, the latest in the rapidly expanding radio field. The news will be in our columns first, and the technical development of the field will be noted by experts as it occurs.

We thank our friends for their support in our infancy, and will put forth every effort to continue to deserve it in our expanding youth.

How Radio Advertising Can Be Made to Pay

By Irving Bresalier

THOUGH radio as a science and art is a comparatively new world-wide development, touching the interests of men and women in every walk of life, the foremost consideration that should be kept in mind by those who are shouldering the responsibility of radio merchandising today is that the basic principles of marketing, no matter what industry is considered, are fundamental.

As a problem of distribution radio should be considered from no different viewpoint than any other new product which might be introduced in any older industry.

Because advertising is strongly linked with selling effort of every kind, and because this indispensable aid to distribution is now proving to be one of the most potent factors in radio merchandising, the application of our best thought and attention to this important subject will meet with due reward.

How can adverising be made to pay? No doubt every advertiser has repeatedly asked himself this question.

To begin with, advertising is not a gamble. Skilfully handled, advertising can be turned into an investment that will pay for itself over and over again in sales made and good-will gained.

Let us consider what elements or factors are fundamental to the success of an advertising campaign, with particular reference to radio.

First and foremost is the necessity of a *definite plan.* Is it desired to establish jobbers or dealers, or are direct sales to consumers sought? A definite decision in this respect is vital, as copy directed to dealers is essentially different from an appeal to consumers. Such considerations as discount schedules, exclusive agencies, etc., should be determined in a specific sales policy even before advertising is started.

In launching an advertising campaign the guiding principle should be consistent effort, as opposed to piece-meal publicity or spasmodic splurges. The constant dripping of water has been known to wear away a rock. The cumulative effect of consistent advertising will in time accomplish its purpose as effectively. In this connection it would be well to remember that "keeping everlastingly at it brings success."

Second: Efficient use must be made of advertising space. Mere capacity to buy large space in a publication is not an assurance of profitable results. The copy of an advertisement must be convincing and its presentation attractive. To attract the attention of the reader and convert his interest to buying desire calls for a thorough knowledge of advertising principles. The responsibility of filling advertising space should therefore be delegated only to one trained in publicity methods. Advertising has developed into a science—it has long ago passed out of the realm when pretty pictures and clever sayings could be depended upon to put across the sales message.

Third: Most advertisers are lulled into a sense of satisfaction upon the receipt of mere inquiries, failing to realize that, at this point, the selling task has only begun. Because of ineffective follow-up of inquiries through attractive and attention-compelling circulars, booklets, catalogues, etc., advertisers are losing their greatest opportunity to turn passing interest into profitable sales. In many cases failure to make advertising pay may be attributed rather to the indifference of the advertiser in the matter of proper follow-up than to the inefficacy of publication advertising as a sales-producing medium.

The writer of this article, upon asking a radio advertiser what results his space was producing, received the boastful reply: "Oh, we are getting a raft of inquiries." Upon asking to see the printed matter for following up these inquiries the writer was informed: "Why, we have no printed matter. All we do is to quote prices on our regular letterhead."

Think of the absurdity of the method of this advertiser! After investing a goodly sum for space practically no subsequent effort is made to capitalize the results. Of course the periodical used by this advertiser will be blamed if sufficient sales are not made to cover the advertising expenditure.

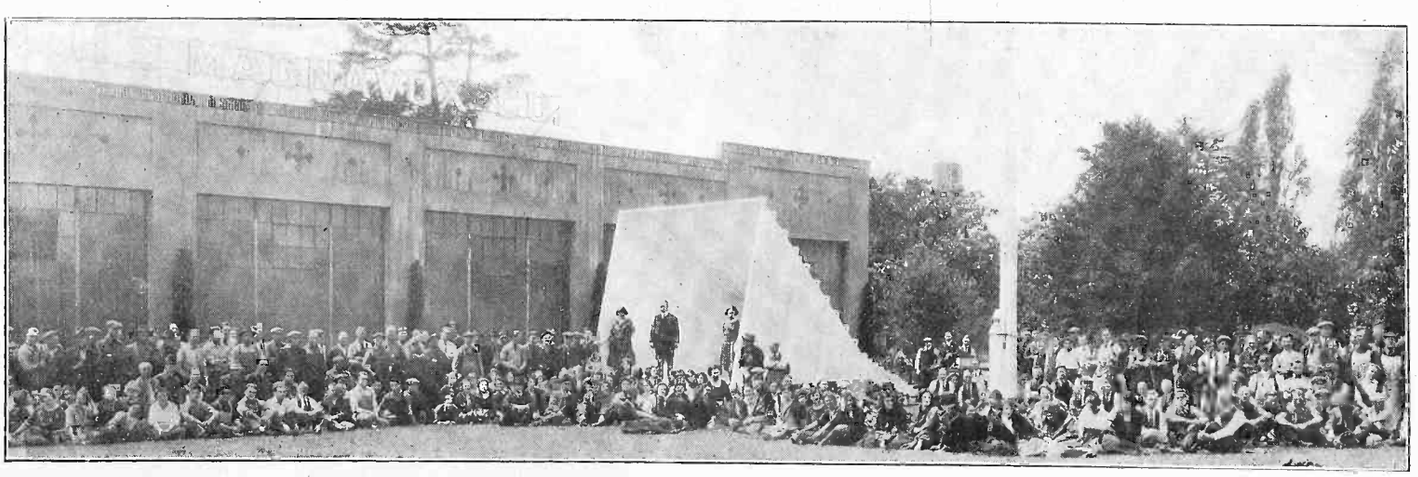
In contemplating advertising one must realize that results cannot be obtained by pursuing a hit-or-miss policy. Permanent, profitable returns can be gained only by adhering to the common-sense principles which are at the basis of all successful advertising. These, summarized, are a pre-determined, specific plan, continuity of effort and effective follow-up of inquiries. There is no reason why the spectacular results achieved through the advertising of products in other lines cannot be realized in the radio field.

Radio Renders Aid in Storm

WHEN a sleet storm which recently raged through the Middle West disabled telegraph wires, broadcasting station KYW, of the Westinghouse Electric & Manufacturing Company, at Chicago, aided news agencies, railroads and brokerage concerns in relieving the ensuing distress.

(Radio Merchandising continued on page 34)

Some of the People Who Make Magnavox for Your Sets



Group of 213 employes (count 'em!) at the Magnavox plant, Oakland, Calif., with the large super-horn designed by them and now being used in an amusement park.

Radio Merchandising

(*Continued from page 32*)

Radio Stocks

(*Quotations as of March 21, 1923, furnished by Frank T. Stanton & Co., 35 Broad Street, New York, Specialists in Wireless Securities.*)

Stock	Bid	Asked
American Marconi, Stamped	5*	15*
American Marconi, Unstamped	5	7
American Tel. & Tel.	122½	123
Canadian Marconi	2½	3½
De Forest Radio	7	10
Dubilier Condenser	8½	8¾
English Marconi com.	11	15
English Marconi pfd.	11½	15½
Federal Tel., Cal.	5¼	5¾
General Electric	185½	186
Hennessy Radio Pub. Corp. pfd.	9	11
Mackay Co. com.	113	115
Manhattan Elec. Supply	61	62
Marconi Int. Marine	8	10
Radio Corporation com.	4¼	4½
Radio Corporation pfd.	3⅜	3½
Spanish Marconi	1	3
Western Union	115	115½
Westinghouse Elec.	64½	65

*Cents per share.

A Help for Reflex Set Builders

Manufactured by Jaynxon Laboratory, 57 Dey Street, New York City

A SYNTHETIC crystal recently brought out by the Jaynxon Laboratory will evidently meet with a great demand by the makers of reflex sets, as well as convert quite a few of the tube users back to crystals for á while. It is a gray composition, resembling lava in appearance. It is equally sensitive over a large surface, and is therefore much to be desired by those who intend to utilize crystal detection in the use of radio frequency or reflex sets. The name of the crystal itself is Reflex, and it therefore suggests that use for the crystal. The fact that it is so extremely sensitive over such a large surface, and under test is practically "unknockoutable," should make it very popular.

The Filkostat Assists Fine Tuning

MR. S. R. HIPPLE, well known for his inventions in the field of electric current control, has devised an instrument called the "Filkostat," designed to utilize the great tuning possibilities of the vacuum tube itself. The Filkostat permits perfect regulation of filament heat, an essential to perfect tuning. The extreme degree of fineness in increase and decrease of electronic flow by infinitesimal gradations makes the Filkostat control ideal and adds to the life of the tube.

This new instrument is claimed to be non-microphonic, absolutely silent and free from all noises, due to perfection of design and ample internal contact. It has other valuable advantages of great interest to amateur radio-set builders, as well as manufacturers. The DX Instrument Company, Harrisburg, Pa., are manufacturing the Filkostat, and its international distribution is in the hands of the Radio Stores Corporation, New York City.

A Compelling Window Display for Radio Dealers

By Arthur G. Shirt

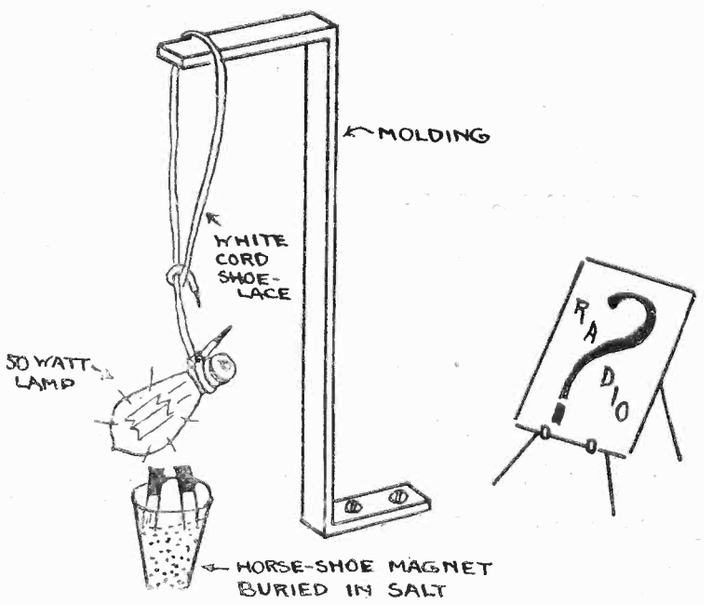
A NOVEL and interest-compelling window device has been used recently by Doughty & Welch, electrical contractors, Fall River, Mass., to call attention to their side-line of radio apparatus. In the very center of their display window, and isolated from the other exhibits, stood an angle stand of wood molding, and from the molding hung a 50-watt electric lamp. Although there were no visible connections to the light it was burning very brightly. Underneath the lamp was a tumbler full of salt, while buried in the salt with its poles turned toward the light was a horse-shoe magnet. How the electricity got to the lamp was a deep mystery, for it was hung from the standard, not by wires, but by a white cord shoe-lace.

The interest taken by the public in this mysterious device more than repaid the trouble taken in making it up. While the crowds outside the window wondered Messrs. Doughty and Welch brought their radio message before them by placing a card in the window with a big red question mark prominently displayed. On the card was printed also the word "*Radio.*"

"Well, it might be," thought the throng outside, "and then again it might not." Probably one out of every twenty went inside the store to find out, and while they were in there they incidentally were introduced to a high-grade line of radio goods. Curiosity may have killed the cat, but it had no damaging effect on the trade of Doughty & Welch.

The secret of the whole device, of course, lies in the clever concealment of the wires leading to the lamp. They come along the floor of the window under the plush or velvet covering and enter the molding from the bottom. They are run up the molding, and both come out into the shoe-lace, so that, although the shoe-lace looks as if it were casually thrown over the standard, it is really fastened there by the wires. One wire goes down to the lamp through one side of the shoe-lace and is soldered on to the shell of the 50-watt lamp. The other wire travels down the other side of the shoe-lace, goes through a hole drilled in the shell and is soldered to the center contact. All this, of course, is carefully done and also carefully insulated so as to prevent short-circuiting. The connections to the base of the lamp are concealed by the wrappings of the shoe-lace around the shell.

The tumbler of salt and the magnet have nothing to do with the device at all. They are placed in a position under the lamp to increase the mystery and possibly to divert the scrutiny of the public from the true explanation. The sign with the big question mark suggests that radio might be responsible, and so calls attention in a novel way to the remainder of the window display, which, of course, is made up of radio apparatus of popular appeal.



Radio Dealer's Window Display Which Is Sure to Attract Attention

New Radio Firms

(*The new firms and corporations mentioned in these columns can be reached directly or by communicating with the attorneys, whose addreses are given whenever possible.*)

Thermoflasher Corp., Syracuse, N. Y., electrical novelties, $15,000; H. N. Frances, F. L. Robbins, C. F. McKay. (Attorneys, Higbie & Malpass, Syracuse.)

Pittsburg Generator Co., McKeesport, Pa., increase of capital from $300,000 to $5,000,000.

Radio Reynolds, New York City, $10,000; B. Reynolds, M. Klein, A. Werner. (Attorney, J. Klein, 152 West 42d St.)

Park Place Radio Electric Company, New York City, $20,000; S. S. Goldstein, M. Heberman, P. R. Steigleman. (Attorneys, Janover & Janover, 30 Church Street.)

Radio Insulate Corp., New York City, transmitting apparatus, $200,000. (U. S. Corporation Co.)

Simplex Radio Corp. and Electrical Supply Co., stocks and bonds, $100,000; Alfonso Berrico, Attilio Derrigo, Robert I. Torone, Boston, Mass. (Corporation Service Co.)

New Era Electric Corp., New York City, $1,500,000. (U. S. Corporation Co.)

Utica Battery and Electric Co., Utica, N. Y., $25,000; H. Rosenmeyer, R. H. Vaughan, H. Meehan. (Attorney, F. J. McEwen, 70 Broadway.)

Nodens, Brooklyn, N. Y., make electric supplies, $25,000; A. and V. A. Noden. (Attorney, B. H. Noden, 115 Broadway, New York City.)

Hall Electric Corp., Kenmore, Erie County, N. Y., $10,000; C. E. and P. B. and R. V. Hall. (Attorneys, Wilcox & Van Allen, Buffalo, N. Y.)

Radio Construction Co., Delaware, 500 shares preferred stock, $100 each; 7,000 common, no par value; rep., H. H. West, 15 West 44th St., New York City.

New Records of The DX Nite Owls

Working Overtime for These

From J. E. Bradley, Justin, Tex.

I WANT to submit to the DX Nite Owls my February report. Worked 107 hours 24 minutes; total stations, 449. Now this doesn't count any station within 100 miles. Days worked, 26 (missed two). 105 different stations, 102 in U. S. A., in 29 different states, 1 in Canada and 1 in Cuba, viz.: WCM, WOAI, WLAL, KLZ, KFAF, WDAF, WHB, KSD, WOS, WHAS, WIAR, WGM, WSB, WDAJ, WOI, WOC, KHJ, WAAZ, WWJ, WDAP, WEAY, WKY, WJAN, WFAV, WFAT, KNJ, WMAB, WEAZ, WPAC, WOAL, WCAH, WKAL, WLAG, WIAO, WBL, WCX, KYW, WLW, KFI, WLK, PWX, WTAW, WOAA, KWH, WHA, WOAK, WOAZ, WHAN, KOB, 5YQ, WMAJ, WAAP, WGY, WMC, WSY, KDKA, WCAZ, WRAM, WKAC, KZN, WOAN, WWAX, WMAT, WJAP, WGV, KDZQ, WJAX, WCAL, WJD, KGW, WQAQ, KFDL, 9DHB, 5ADO, WLAZ, WCAR, WGF, WPAH, WIAS, WMAV, KDPT, WPAS, WCAJ, KFFQ, KDYS, WMAQ, WMAK, KFAP, WPAK, KFHJ, WOR, WCAZ, WLAS, WJZ, WCAS, WAAN, KFBK, WGAT, KUO, WUD, WBT, WPE, WJAQ, WHAB, CHBC.

I would like to hear from some DX'ers with two-tube sets. Mine is a two-tube (WD-11) short wave regenerative, consisting of two-tubes and sockets, Grid leak and condenser, phone condenser, two rheostats, one variometer, two condensers and one transformer. I thank you for devoting part of your good magazine to us DX'ers.

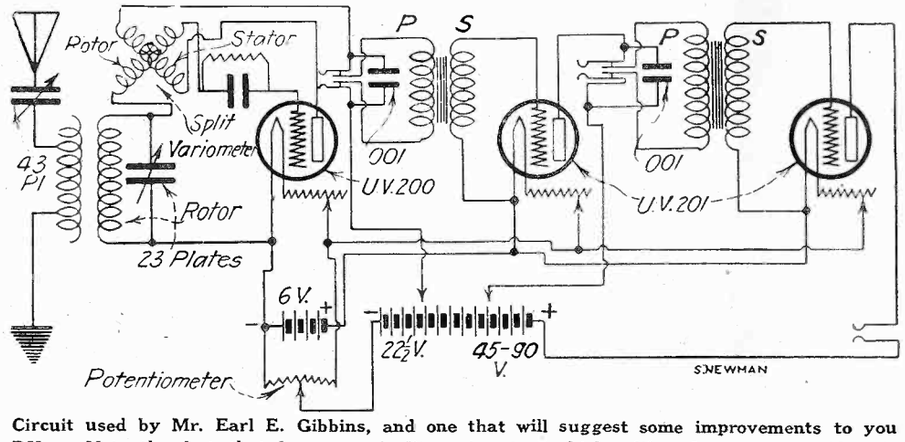
* * *

THE Editor of RADIO WORLD will be pleased to receive sketches of hook-ups drawn carefully in black ink or heavy pencil from the "DX Nite Owls" who send in records with a view to publishing them.

Send hook-ups of your sets, provided they contain something unusual. Send, also, the names of the various makes of apparatus you are using.

Make your letters brief and informative. Write on one side of the paper only.

The letters and hook-ups will be published in the earliest possible numbers of RADIO WORLD.



Circuit used by Mr. Earl E. Gibbins, and one that will suggest some improvements to you DXrs. Note the fact that he uses a split variometer, which, although not a new idea, is original, and that is what counts.

Uses Home-Made Spider Web

From Joe Colborn, Memphis, Tenn.

I AM very much interested in the "DX Nite Owls" as published in RADIO WORLD. I am sending in my record:

WDAJ, WHB, KDKA, WBAP, WSB, WLAG, WLW, KSD, WOC, WAAL, WJAK, WFAA, WWJ, WDAF, WGY, WCX, WBT, KFAF, WHAS, WOAI, WOR, PWX.

I am using home-made, spider web coils and WD-11 tube without amplification.

* * *

From a Young Buckeye

From Ralph Mallory, Columbus, Ohio.

I HAVE been reading your DX Nite Owls' records and decided to send mine in. I am thirteen years old. On February 15 about one hour and fifteen minutes. The stations are as follows: KDKA, WIAO, WOR, WOO, WHA, WOC, WDAP, WIAR, WGY, WMAQ, and WDAJ through WEAO. I have heard stations throughout the country, including Canada, Cuba, Hawaii, Porto Rica and ships. I have a two step and Magnavox. I have a little crystal set, and have heard KDKA, WJS, WWJ, WOC, WHAS, and February 21 I heard a station in Kansas during WPAL. I only use my crystal set when I am getting my battery charged.

* * *

A New One from a DX'r to the Bunch!

From Earl E. Gibbins, Room 217, Dexter Bldg., Springfield, Mass.

ENCLOSED you will find a simple but very effective circuit with which I am receiving the United States, Canada, Cuba, and all the others worth mentioning.

After reading your magazine regularly and noticing the DX results I feel that my circuit is worth of mention and will give the Nite Owls something to shoot at, even if it should pass over their heads.

It is an original idea of my own, after plenty of experimental work, and I am sure that it is the equal of any if not superior to most of them for bringing the DX.

I have varied the original circuit and use a split variometer which I believe makes it different from any other circuit that has heretofore been published. I will be glad to furnish any additional data upon request, if a stamped self-addressed envelope is enclosed for reply.

If any "Nite Owls" can suggest any improvements on this, I will be glad to "get together" with them.

* * *

Hot Dawg! Let's Step!

From C. W. Hallowell, Susanville, Calif.

The writer was discussing the article on Radio Golf which appeared in your magazine under date of Feb. 3d, with the "Old Man" of our local radio colony here, Mr. H. B. Pearce, who stated that he was of the opinion that this record could be broken and on the evening of Feb. 13th proceeded to do so.

We are, therefore, submitting attached a list of the stations which he received and practically in the order in which they came in. Considering that all stations East of California have to be brought through some of the powerful California stations which are on early in the evening, we were at a serious disadvantage compared with persons situated in the Mississippi Valley or even on the Atlantic coast, and under the circumstances feel that a record of about 7,000 miles per hour will give the boys something to shoot at for a few days.

The set which was used was a British Radio-Frequency Tuned-Plate Reactance Type Receiver which was built by Mr. Pearce, Mr. George Harrison and the writer. 5:00 to 10:25 P. M. Pacific standard time. WGY, Schenectady, N. Y., 2,502 miles; WJZ, Newark, N. J., 2,516; WHAS, Louisville, Ky., 1,941; WAAS, Decatur, Ga., 1,950; WCOE, Pittsburgh, Pa., 2,221; KGG, Portland, Ore., 381; KUO, San Francisco, Calif., 226; KWH, Los Angeles, Calif., 474; KMO, Tacoma, Wash., 503; WWJ, Detroit, Mich., 2,027; KFBK, Sacramento, Calif., 137; KDYL, Salt Lake City, Utah, 482; WHA, Madison, Wis., 1,680; KHJ, Los Angeles, Calif., 474; KZM, Oakland, Calif., 216; KZN, Salt Lake City, Utah, 482; KLZ, Denver, Colo., 863; KLX, Oakland, Calif., 216; KFV, Yakima, Wash., 446; KFAF, Denver, Colo., 863; WBAY, New York, N. Y., 2,530; WBAP, Fort Worth, Texas, 1,445; WCX, Detroit, Mich., 2,027; CFCN, Calgary, Canada, 866; KJS, Los Angeles, Calif., 474; WDAP, Chicago, Ill., 1,783; KDPT, San Diego, Calif., 589; KMJ, Fresno, Calif., 309; KFAN, Moscow, Idaho, 489; KGB, Tacoma, Wash., 503; KFEL, Denver, Colo., 863; KWG, Stockton, Calif., 180; KPO, San Francisco, Calif., 226; WLW, Cincinnati, Ohio, 1,991; KGY, Lacey, Wash., 475; KFAT, Eugene, Ore., 180; KFHJ, Santa Barbara, Calif., 350; WFAA, Dallas, Texas, 1,481; WDAF, Kansas City, Mo., 1,445 miles. Total, 38,806 miles.

* * *

Come Along, Owls!

From Fred Temby, Bloomingdale, N. J.

FOLLOWING are the stations I received using a single-circuit, feed-back set and one W-D 11 tube:

2XY (testing), WJZ, WOR, WSB, WBS, WRW, WOI, WIP, WFI, WLW, WBZ, KOP, KYW, WMH, WGI, WGY, WRK, WWJ, WOC, WBAY, WCAN, WNAC, WBAP, WKAA, KDKA, WCAE, WAAM, WHAS, WBAN, WGAM, WGM, WST, WBAZ, WAAP, WHAZ, WGF, WOO, WCZ, WMAM, WMAQ, WAAW, WMZ, WAID, WLAC, WJAX, WWI, WHAM, KSD, WBT, CHYC, WBAP, PWX.

These stations came in clear, and I am sure of every one. I received several of which I am not sure, and which I have not marked. These were received in less than two months.

* * *

Come Along, You Cotton Planters!

From D. M. Dunbar, Box 641, Cotton Plant, Arkansas

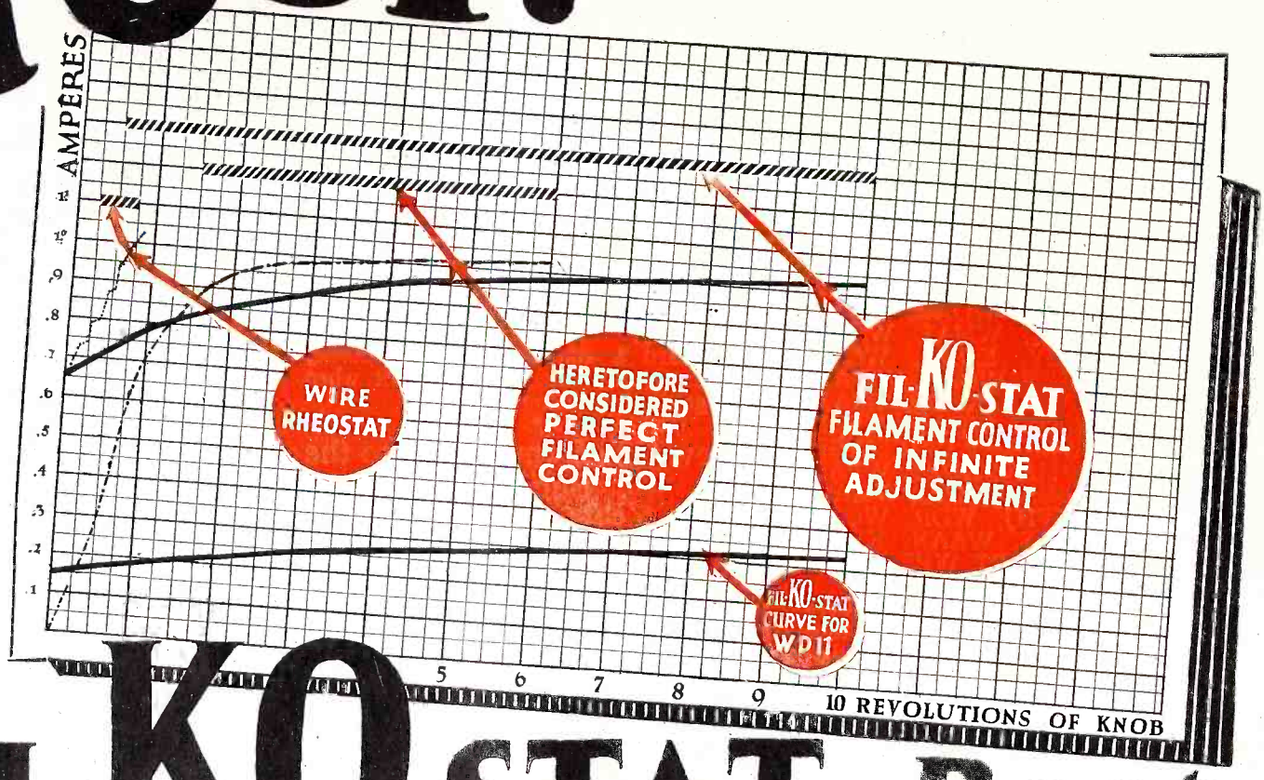
I HAVE a few DX remarks to make. I built a receiver by the directions of Ortheus Gordon in Jan. 20th issue of RADIO WORLD, using Kellogg 43 condenser, De Forrest 50 and 75 H. C. coils, Na-ald socket, Freshman variable grid leak and condenser. When completed this circuit brought in the following places all clear and fine: WOC, WHB, WOAI, KSD, WDAP, WDAJ, WSB, WOS, WDAF, KFAF, WBAP, WLAG, WMC, WCX, WHAS, WSY, WKY, KWH, KFI, WAAP, WLK, WLW, WBL, WHA, WGAY, and last of all I have had WGY five times straight running.

Proof!

Graphic proof of FIL-KO-STAT superiority as shown here can be had in any laboratory equipped with Bureau of Standards Instruments.

Practical proof of FIL-KO-STAT superiority is evident the moment you put FIL-KO-STATS in place of the devices you now use to regulate filament action.

Here's the Comparison of Fine Adjustment Control Range of FIL-KO-STAT with Rheostats and Other Filament Controls Clearly Indicating How FIL-KO-STAT Excels and Showing Wherein it Permits Perfect and Gradual Current Increase With Infinite Adjusments



FIL-KO-STAT *Best* Filament Control

The filament kontrol of infinite adjustment

FIL-KO-STAT

CURRENT INCREASE PERFECT AND GRADUAL

LIKE THE RISING SUN

Trade Mark Registered

Infinitesimal Control
of Electronic Flow

Definite Off
indicating complete "A" Battery disconnection.

Fine Adjustment
starts where tube *begins* to function.

At Full On
Resistance practically zero.

Absolutely Silent
Non-michrophonic, free of all noises.

No Current Variations
Resistance constant at any setting.

No Disks to Break or Chip
Resistance element so finely divided further division impossible.

GUARANTEED

The FIL-KO-STAT is to all purposes "fool proof". Each instrument is packed with the maker's guarantee that it will be replaced if broken within one year.

Manufactured by

DX INSTRUMENT CO
HARRISBURG PA.

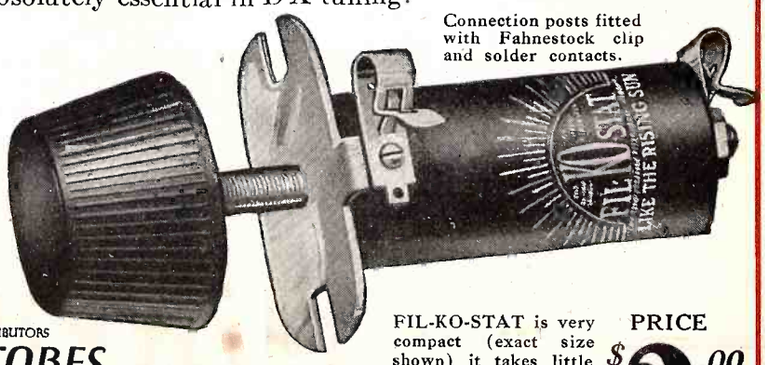
You have been eagerly waiting for just this instrument Mr. Set Builder, amateur or manufacturer. It marks a step forward in Radio. It is not an adaptation of some old method of current control. It is not a rheostat. IT IS A FILAMENT CONTROL, distinctly designed to utilize the great tuning posibilities of the vacuum tube itself.

Its superiority is proven by every test. It regulates the FILAMENT HEAT. It gives absolute control of the ELECTRONIC FLOW and consequently permits THE FINEST TUNING POSSIBLE.

Perfect and gradual increase of filament heat assures longer life to the tube. Fine adjustment of fractional currents makes it ideal for use with Dry Cell tubes.

And infinitesimal control of electronic flow gives a corresponding control of fine detection so absolutely essential in DX tuning.

The time to replace all other filament control devices with FIL-KO-STATS is *now*. Say "FIL-KO-STAT" to your dealer today. If he has none in stock send his name and your remittance direct to



Connection posts fitted with Fahnestock clip and solder contacts.

SOLE INTERNATIONAL DISTRIBUTORS

RADIO STORES CORPORATION
218-222 West 34th St.
Dept. R.W. NEW YORK

WIRE ORDERS FILLED TO JOBBERS AND DEALERS

FIL-KO-STAT is very compact (exact size shown) it takes little space on the panel. So mountable it can replace any other control without redrilling.

PRICE $2.00

"Of all the innumerable crystal sets, none can even remotely compare with the NATIONAL AIRPHONE"

DR. H. BORDEN CLARKE & CO.
Largest Wholesale Radio Service in Eastern Canada
CLARKE BUILDING
1034-38 Barrington St.

NATIONAL AIRPHONE CORPORATION,
New York City, U. S. A.

Halifax, Canada, February 5, 1923.

Gentlemen:

I wrote you some time ago that we intended testing out your National Airphone Crystal Set for long distance work.

The splendid results allow me the pleasure of informing you that your modest claim of Distance Range is altogether too conservative.

Together with several responsible friends I am willing to testify before any legal agent that we have received complete, concise, clear and natural programs from WGY, New York, Newark, N. J., and Philadelphia Pa.—besides two other unknown stations of long distance.

Our aerial is the average 100 foot one, our office location is very low indeed, near the harbor shore.

Further, slipping your compact little set into my hunting jacket pocket I recently went back in the hills to my camp, hunting; throwing a short wire over a pine tree and in the cabin window. I received that evening two Halifax stations and WGY very clearly. (Halifax, N. S., is about 800 miles northeast of the nearest station mentioned herein.)

Of all the many innumerable Crystal sample sets sent me for testing, none can EVEN REMOTELY COMPARE WITH THE NATIONAL AIRPHONE; WORKMANSHIP, APPEARANCE, POWER, RANGE and COMPACTESS PLACE IT FAR ABOVE ALL.

Yours very sincerely,
(Signed) H. B. CLARKE.

HBC/ED

READ THE TESTS

NATIONAL AIRPHONE CORPORATION,
16 Hudson Street,
New York, N. Y.

Ridley Park, Pa., December 28, 1923.

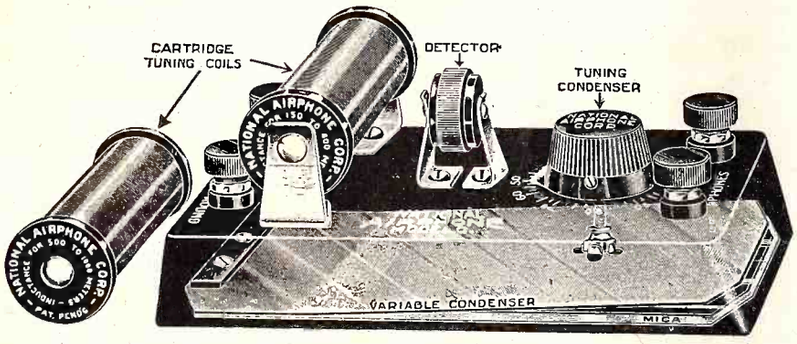
Gentlemen:

Received the two Gold Grain Detectors shipped on the 23rd, and put one in a set using three stages of radio frequency amplification and two audio employing three tubes.

It may interest you to know that I actually got 50% better results as regards distances received with your detector than with a tube and there was no comparison as regards quality of music inasmuch as the parisitic noises generated in the Vacuum Tube when used as a detector were absent. In fact I got less noise of an objectionable character with three stages of audio frequency after your detector than I do with two after a tube detector.

Last night I listened to Havana, Atlanta, Pittsburgh and Davenport without changing the setting of the detector and what is more remarkable is the fact that even with three steps of radio ahead of your detector the powerful currents generated from receiving WFI and WIP (not 10 miles away) were not sufficient to destroy the sensitivity of this remarkable piece of apparatus.

Yours very truly,
(Signed) J. R. BAISLEY.



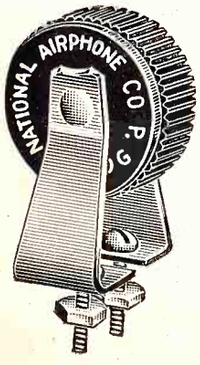
NATIONAL AIRPHONE

MODEL G

The most practical radio set ever made. It is so simple that you need know nothing of radio to operate it. Even a child can get perfect results. No unnecessary complications of any sort. Nothing to fuss with, no batteries, no tubes. No time lost in making adjustments. Just turn the knob and listen. No cost of upkeep or maintenance of any kind.

Complete as shown with 2 Interchangeable Inductance Coils $12.50

Reproduces voice and music in natural color and tone without distortion



(Actual Size)

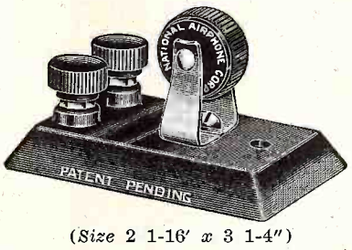
"GOLD GRAIN" DETECTOR

For Panel Mounting

$2.00

Can be fitted to any radio receiving set. A revelation to users.

"PUTS THE JOY IN RADIO"



(Size 2 1-16′ x 3 1-4″)

"GOLD GRAIN" DETECTOR

Mounted on base with two binding posts..... $2.50

We are the originators and sole manufacturers of the super-sensitive, semi-automatic "Gold-Grain" Detector, the highest development in Tubeless reception. This Detector consists of an air and moisture proof cartridge, hermetically sealed, in which is enclosed the contact element of pure gold. Has no catwhisker, eliminates hunting for sensitive spots. Simply turn the knurled cylinder and tap lightly with the finger. New contacts are established instantaneously. It gives the clearest and loudest reproduction of all sounds without distortion.

TRADE MARK NATIONAL AIRPHONE CORPORATION REG. U.S. PAT. OFF.

W. 16 HUDSON STREET, NEW YORK, N. Y.

DO YOU WANT TO BUY, SELL OR EXCHANGE RADIO OR OTHER GOODS? TRY THIS DEPARTMENT AT 5c A WORD

RADIO WORLD'S QUICK-ACTION CLASSIFIED ADS

This department is intended for everybody who wants quick action on short announcements covering the buying, selling, exchanging or general merchandising in the radio field. Readers of RADIO WORLD will find that it pays to read these columns every week. Advertisers will get a ten-day service here—that is, copy received for this department will appear in RADIO WORLD on the news-stands ten days after copy reaches us.

The rate for this RADIO WORLD QUICK-ACTION CLASSIFIED AD. DEPT. is 5c. per word (minimum of 10 words, including address), 10% discount for 4 consecutive insertions, 15% for 13 consecutive insertions (3 months). Changes will be made in standing classified ads. if copy is received at this office ten days before publication. RADIO WORLD CO., 1493 Broadway, N. Y. C. (Phone, Bryant 4796).

W. D. 11 TUBES FOR OLD. Mail me burnt out or broken W. D. 11 and $4.50, Amplifier and $3.50, or Detector and $3.00, and a guaranteed and tested tube will be mailed to you. Satisfaction or money refunded. Tubes returned C. O. D. E. WATERMAN, 192 Ainslie Street, Brooklyn, New York.

SUPER RADIO FREQUENCY transformers and Super Tuning units. Something new. Write. Radio Experimenters Service, 727 Bates St., Detroit, Michigan.

FOR QUICK SALE—Variometer regenerative receiver, detector unit, phones and tube. Only $32.50. New. 9AVO, 746 South Armstrong, Kokomo, Indiana.

HIGHEST PRICES PAID for old gold, silver, platinum, diamonds, and false-teeth. Mail to Brody's Refinery, 79 Reid Ave., Brooklyn, N. Y.

SELL—Two new Radio Corporation UV-1714 Radio Frequency Transformers, $10.00. Ross Rich, Mahonoy City, Penna.

FOR SALE—Cutting & Washington Type 11 detector and two stage amplifier complete with tubes, phones and B batteries, $85.00. K. C. Matheson, Box 186, Clinton, Nebraska.

GUARANTEED—5 celebrated tobacco remedies, $1.00. Any form. Safe, sure, quick. AMERICAN SALES CO., Box 1278, San Francisco, Calif.

BUILD YOUR OWN PHONOGRAPHS. We can supply you with motors, tone arms, and all accessories at wholesale prices. Write for catalog AX. PLEASING SOUND PHONOGRAPH CO., 204 E. 113th St., New York, N. Y.

MANUFACTURERS—Rights on absolutely the best crystal detector yet developed for sale. Seven to eleven sensitive spots always in reserve. Low manufacturing cost. RADIO EXPERT, 77 Walnut St., Norfolk, Va.

30% DISCOUNT on radio apparatus. All standard makes. N. E. Ristey, Spring Grove, Minn.

REINARTZ GREEN SILK WOUND SPIDER WEB COILS, $1.85. Very selective. Equal to coils sold as high as $6.00. If not satisfactory, return same and money will be refunded. L. A. Lindgren & Co., 4056 Oakenwald Ave., Chicago, Ill.

CHEAPEST TO BUILD—Easiest to tune. Get particulars Rokay Single Control Hook-up. Describe your set. Rokay Electric Company, Ingomar, Ohio.

BEAUTIFUL WHITE TEETH—YOU can have beautiful white teeth without toothbrush, pastes or powders. No matter how badly discolored your teeth are, this harmless secret will make them white. Economical, sanitary. Price, 25c. AMERICAN SALES CO., Box 1278, San Francisco, Calif.

$10,000 for an idea. League of American Inventors, Washington, D. C.

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STANDARD ELECTRICAL DICTIONARY—By Prof. T. O'Conor Sloane. Just issued an entirely new edition brought up to date and greatly enlarged—as a reference book this work is beyond comparison, as it contains over 700 pages, nearly 500 illustrations, and definitions of about 6,000 distinct words, terms and phrases. The definitions are terse and concise and include every term used in electrical science. 767 pages, 477 illustrations. (See page 18 for fuller description.) Price, $5.00. The Columbia Print, 1493 Broadway, New York City.

EXCHANGE LETTERS with friends everywhere. Pleasant pastime. Information for stamp. Smith, Box 3125, M. Portland, Ore.

VACUUM TUBE RESULTS WITH A CRYSTAL SET!—Cover distance with a "PT" ULTRA-SENSITIVE CONTACT in your crystal detector. Beats gold and other ordinary catwhiskers. DOES NOT JAR OUT. Using the "PT," Myrle Wood heard over 43 broadcasting stations in a thousand mile radius! Other users testify: "Heard new stations on first adjustment. Has all advantages you claim. Receives music so loud it hurts my ears." The "PT" has received 3,300 miles through static. Price only twenty-five cents. "PT" CRYSTAL CONTACT COMPANY, Box 1641, Boston, Mass.

FOR SALE—Paragon Regenerative receiver, R.A.10, Detector, and two-step D.A.2. Both $110.00. Crosley two tube set, $25.00. All apparatus new and guaranteed. Write Philip Coblentz, Middletown, Maryland.

VARIABLE CONDENSERS at factory prices. 3 plate, $1.05; 11 plate, $1.35; 21 plate, $1.60; 43 plate, $2.05. Send cash with order. GREENLEAF, 34 Merchants' Row, Boston, Mass.

BATTERIES—Edison Storage "B" Battery Elements, 5c per pair; 18 will make one 22.5 volt Battery. GILMAN'S BATTERY SHOP, Chelsea Sq., Chelsea, Mass.

EXCHANGE JOLLY, INTERESTING LETTERS through our club. Stamp appreciated. Betty Lee, Inc., 4254 Broadway, New York City

VERNIER VARIABLE CONDENSERS—Capacity, .0006. $1.48 postpaid. Fully guaranteed. Cherpeck Company, 3123 Davlin Court, Chicago.

FOR SALE—Variometers and variocouplers, $3.00 each, 3000 meters. Receiving transformers, $6.00. Anthony Sini, Box 123, Shoreham, Long Island, N. Y.

OLD MONEY WANTED—$2.00 to $500.00 **EACH** paid for hundreds of Old and Odd Coins. Keep all old money. Send 10 cents for New Illustrated Coin Value Book, 4x6. You may have valuable coins. Get posted. We pay CASH. Clarke Coin Company, Ave. 83, Le Roy, N. Y.

HOW TO BECOME A SUCCESSFUL ELECTRICIAN—By Prof. T. O'Conor Sloane. An interesting book from cover to cover. Telling in simplest language the surest and easiest way to become a successful electrician. The studies to be followed, methods of work, field of operation and the requirements of the successful electrician are pointed out and fully explained. 202 pages. Illustrated. Nineteenth revised edition. Cloth. Price, $1.50. The Columbia Print, 1493 Broadway, New York City.

A COURSE IN MECHANICAL DRAWING—By Louis Rouillion. The author has written a most practical book on the subject of Mechanical Drafting. It fully explains the art of Drawing, Lettering and Dimensioning. It is, by far, the most practical book ever published on this subject, for use in day and evening schools, and more especially adapted for the teacher and for self instruction. Fifteenth edition, revised and enlarged. Fully illustrated. Oblong. COLUMBIA PRINT, 1493 Broadway, N. Y. C. Price, $1.50.

BUILDERS AND EXPERIMENTERS. Do you know that the Reflex circuit is one of the most interesting circuits to construct? You can not guess how much fun you are missing if you fail to try out at least one of these circuits. See RADIO WORLD issues of Feb. 24 and March 3. They contain two fine articles by W. S. Thompson, with plenty of new Reflex circuits to experiment with. Don't miss these! 15c. a copy. RADIO WORLD, 1493 Broadway, New York City.

DO YOU WANT TO SAVE MONEY in making your set? Send for the Jan. 27 issue of RADIO WORLD, containing a full-page drawing of how to make filament control rheostats, as well as an easily understandable text, which makes the construction easy. 15c a copy, or start your subscription with this issue. RADIO WORLD, 1493 Broadway, New York.

SUPER-SIMPLICITY CIRCUIT—1,000 to 1,500 miles on one tube, one control, 150 to 25,000 meters. No rheostat, storage battery, vario coupler, variometer, 3-coil mounting, variable inductance, taps or radio frequency. Nothing to guess about. Complete hook-up and particulars, $1.00. No checks. Build your own. Save 50% and get better results. RADIO EXPERIMENTAL LABORATORY, Box 194A, Berkeley, Calif.

GUARANTEED VARIOCOUPLERS, $2.25.—RADIO ASSEMBLY, 1109 Valley St., Joplin, Mo.

SOLDER YOUR RADIO CONNECTIONS with Radsol, the new soldering paste. Price, 20 cents. Dealers write. DAVIS PROCESS CO., 219 Devoe St., Brooklyn, N. Y.

AGENTS—Are you interested in radio? If so drop us a card. We have a proposition no live agent should turn down. Meets the needs of 90 per cent. of the public. THE WILKENDA CO., 500 Fifth Avenue, New York City. Dept R.W.

CASH FOR OLD GOLD, Platinum, Silver, Diamonds, Liberty Bonds, War, Thrift, Unused Postage Stamps, False Teeth, Magneto Points, Jobs, Any Valuables. Mail in today. Cash sent, return mail. Goods returned in ten days if you're not satisfied. OHIO SMELTING CO., 337 Hippodrome Bldg., Cleveland, Ohio.

HOW TO REPAIR Vacuum Tubes. Complete literature, $1.00. Box 103, Station C, Toledo, Ohio.

RAND-McNALLY RADIO MAP OF UNITED STATES—Is 28 x 30 inches in size. The locations of broadcasting stations are shown by distinctive symbols. The call letters of each station are given, also the wave lengths of each. The Radio Districts with numbers are shown in red and the Radio Relay Divisions are in blue. Time zones are included. Alphabetical lists of stations and alphabetical lists of call letters are in the margins. Convenient pocket form with cover. Price, 35c. The Columbia Print, 1493 Broadway, New York City.

MODEL MAKING—By Raymond Francis Yates. A new book for the mechanic and model maker. This is the first book of its kind to be published in this country, and all those interested in model engineering should have a copy. The first eight chapters are devoted to such subjects as Silver Soldering, Heat Treatment of Steel, Lathe Work, Pattern Making, Grinding, etc. The remaining twenty-four chapters describe the construction of various models such as rapid fire naval guns, speed boats, model steam engines, turbines, etc. 400 pages. 301 illustrations. Price, $3.00. The Columbia Print, 1493 Broadway, New York City.

TWENTIETH CENTURY BOOK OF RECIPES, FORMULAS AND PROCESSES—Edited by Gardner D. Hiscox. This book of 800 pages is the most complete book of recipes ever published, giving thousands of recipes for the manufacture of valuable articles for every-day use. Hints, helps, practical ideas and secret processes are revealed within its pages. It covers every branch of the useful arts and tells thousands of ways of making money and is just the book everyone should have at his command. The pages are filled with matters of intense interest and immeasurable practical value to the photographer, the perfumer, the painter, the manufacturer of glues, pastes, cements and mucilages, the physician, the druggist, the electrician, the dentist, the engineer, the foundryman, the machinist, the potter, the tanner, the confectioner, the chiropodist, the manufacturer of chemical novelties and toilet preparations, the dyer, the electroplater, the enameler, the engraver, the glass worker, the gold-beater, the watchmaker, the jeweler, the ink manufacturer, the optician, the farmer, the dairyman, the paper maker, the metal worker, the soap maker and the technologist in general. A book to which you may turn with confidence that you will find what you are looking for. A mine of information up-to-date in every respect. Contains an immense number of formulas that everyone ought to have that are not found in any other work. New edition. 807 octavo pages. Cloth binding. Price, $4.00. The Columbia Print, 1493 Broadway, New York City.

Address Wanted:—The address of Arthur Kimberling. Write Business Dept., Radio World, 1493 Broadway, New York City.

Moving Pictures by Radio Predicted by Jenkins

THE American family will be able, in the near future, to gather about the radio set in the parlor and see a complete moving picture show. This is the confident prediction of C. Francis Jenkins, inventor, who is putting the finishing touches at his laboratory in Washington, D. C., on apparatus for transmitting and receiving moving pictures.

Mr. Jenkins recently startled the radio-fascinated public by the transmission of photographs of Harding, Coolidge and other notables from Washington to Philadelphia, the first long-distance transmission of photographs by radio ever accomplished. This device was illustrated and described in RADIO WORLD for March 17, 1923.

"I will have my apparatus ready for a trial within a very short while," Mr. Jenkins is quoted as saying. "I have nearly finished it, and am absolutely confident that the experiment will be successful. There is nothing in the way of transmission of moving pictures but a matter of speed, and I am sure I can provide for that."

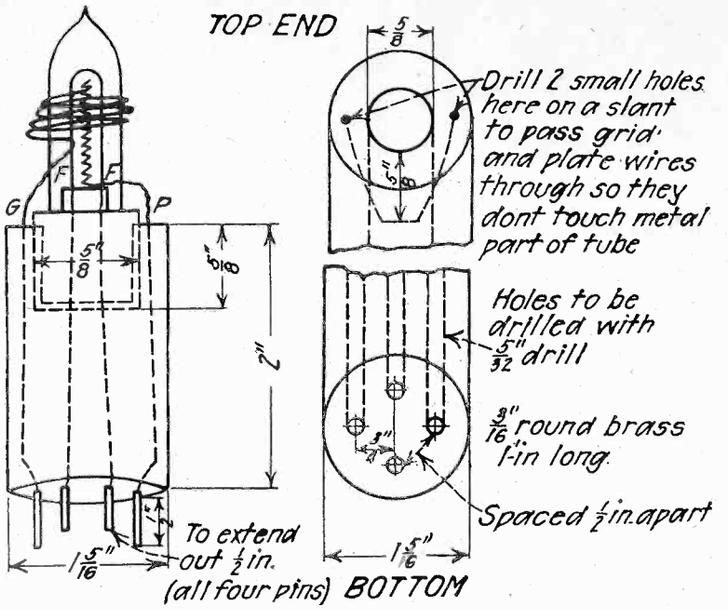
Hammond Sells 200 Radio Patents

RADIO devices developed by John Hays Hammond, Jr., primarily for wartime use by the government, which include methods of operating aerial and marine torpedoes and maneuvring battleships without personnel for target practice, have been sold, it was announced in Washington, D. C., last week, to the Radio Corporation of America and the American Telephone & Telegraph Company.

The government, however, will retain an option on all of the devices for military use and for experimentation with aircraft bombing. Mr. Hammond and his assistants will be retained as consulting engineers by the Radio Corporation. Approximately 200 separate patents have been conveyed to the commercial companies in the transaction.

Making a Socket Adapter for a Peanut Tube

By P. F. Metzler



SOCKET adapters for W. T. 501 peanut tubes are scarce and hard to get, so it's up to the amateurs to make them for themselves. The one herewith described will be found to be very satisfactory, as it can be shifted from one socket to another without disconnecting any wires or running the risk of breaking the lead from the grid or plate.

The sketches show all details of making this adapter. No. 1 gives a general outline as it appears when finished. No. 2 shows the top view, and No. 3 shows the bottom view where the four brass pins are placed. The pins are made out of 3-16 round brass, one inch long, slightly rounded.

You will also have to get a round wood piece two inches long and 1 5-16 inches in diameter. In this drill a hole on one end ⅝ in diameter and ⅝ deep. On the other end drill four holes with a 5-32 drill all the way through into the ⅝ hole. Then on top on each side of the ⅝ hole drill two more small holes so that they will come out at bottom of ⅝ hole. These are for the grid and plate series. Next, solder onto the tube four fine wires leading from the grid, plate and filament contacts. These go through the four 5-32 holes.

Next, drive in the brass pins ½ inch. Solder the four wires to these as close to the base as possible. Have a socket handy and make the pins correspond with the grid, plate and filament. Be very careful about this, as you may burn out a tube if you place it in the socket incorrectly.

Next, drive a small pin in the side to hold it in the socket. You might place the adapters in the socket in the right place and press down slightly. Mark with a pencil where the pin belongs. A real small nail cut off about ⅜ inch long will answer, using the point end.

Broadcasting Stations Can Not Send Personal News

BROADCASTING stations receive requests almost daily to send out messages of a personal character. One man requested WGY to send a description of his Airedale pup which was lost and greatly missed by his children. Another asked that the waiting world be informed that his family was well.

Those who make requests for the broadcasting of purely personal matters are informed that the stations are not permitted, under their licenses issued by the United States Department of Commerce, to put anything into the air that might be interpreted as a personal or commercial communication.

RADIO WORLD

TELEPHONE, BRYANT 4796
PUBLISHED EVERY WEDNESDAY (Dated SATURDAY OF SAME WEEK)
FROM PUBLICATION OFFICE,
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M. B. HENNESSY, Vice-President
FRED S. CLARK, Secretary and Manager
1493 BROADWAY, NEW YORK, N. Y.

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Managing Editor: Stephen L. Coles
Technical Editor: Robert L. Dougherty

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Fifteen cents a copy. $6.00 a year. $3.00 for six months. $1.50 for three months.

Add $1.00 a year extra for foreign postage. Canada 50 cents.

Receipt by new subscribers of the first copy of RADIO WORLD mailed to them after sending in their order, is automatic acknowledgment of their subscription order.

ADVERTISING RATES

One page: One time—$150.00.

Half Quarter, Third and Two-thirds pages at proportionate rates.

One inch, one time—$5.00. Per agate line $0.40.

On four consecutive issues, 10% discount.

On thirteen consecutive issues, 15% discount.

Cover and preferred-position rates made known on application.

Terms: 30 days net. 2% 10 days.

CLASSIFIED ADVERTISEMENTS

Five cents per word. Minimum, 10 words. Discount of 10% on 4 consecutive issues—15% on thirteen consecutive issues. Cash with order.

Entered as second-class matter, March 28, 1922, at the Post Office at New York, New York, under the act of March 3, 1879.

IMPORTANT NOTICE

While every possible care is taken to state correctly matters of fact and opinion in technical and general writings covering the radio field, and every line printed is gone over with a scrupulous regard for the facts, the publisher disclaims any responsibility for statements regarding questions of patents, priority of claims, the proper working out of technical problems, or other matters that may be printed in good faith and on information furnished by those supposed to be trustworthy. This statement is made in good faith and to save time and controversy in matters over which the publisher cannot possibly have control.

Wireless Installations Barred in China

NEWS, said to be from an official source, was sent out from Washington, D. C., last week announcing that the government of China has refused the application of the Westinghouse Electric International Corporation for permission to import radio materials into China and to establish broadcasting and receiving stations.

Permission was refused by the Chinese Minister of War, it was asserted, on the ground that radio apparatus is contraband of war and therefore cannot be brought into China, upon pain of seizure. Reference was made by the Chinese authorities to the resolutions concerning the radio adopted by the Washington Arms Conference, one of which declares that all stations operated within the territory of China by foreign governments or the citizens or subjects thereof under treaties or concessions shall limit the messages sent and received by the terms of the treaties or concessions under which they are established. The American contention is that none of the arms conference treaties are yet in effect, not having been ratified by all the signatories.

Attention also was called to the resolution providing that stations maintained without the authority of the Chinese Government shall be transferred to the Chinese and operated under direction of the Communications department.

The refusal of the Chinese Government is regarded by American interests in China as a further example of the growing tendency of Chinese officials to quibble over every technicality when foreigners are involved, and to read extraneous privileges and precepts into international agreements.

Vesper Services at WGY Are Multiplied

EVERY Sunday afternoon a little group of people assemble in the radio studio of WGY, in the midst of the towering factory buildings of the General Electric Company at Schenectady, N. Y., and conduct a vesper service, including organ selections, hymns, Scripture reading and sermon. The group in the studio is small, but many thousands in city and country participate in the devotions.

These services not only enter many homes, but they are multiplied by means of receiving sets and loud-speakers, and made to furnish the religious inspiration of other gatherings in distant places. For example, the Railroad Y. M. C. A. at Oneonta, N. Y., no longer arranges for a special afternoon service, but instead receives WGY; and, according to a letter from the general secretary, A. C. Lange, "these services come through very clear, and are enjoyed by all who attend."

Charles J. Clark, a merchant at Holland Patent, N. Y., informed WGY that the Baptist Church at that place was closed recently on account of the scarcity of coal. He invited the congregation to meet with him in his home, and they listened to the service broadcast by WGY.

New Westinghouse Building in New York City

THE Westinghouse Electric & Manufacturing Co. has leased 12 floors in the new 23-story Westinghouse Building, to be erected at Broadway and Liberty street, New York City.

Radio Killing Phonograph Sales

C. J. ROSENTHAL appeared before the the Second National Radio Conference, at Washington, D. C., last week, claiming that, unless they paid royalties to the writers of songs and music used in their programs, the owners of broadcasting stations would be prosecuted under the copyright law. He was talking in defense of the Society of Authors, Composers and Publishers of America, and said in part: "The situation is serious. Radio is affecting the sales of sheet music and phonograph records. The radio sets are placed on top of the phonograph, which are not used any more. In New York, St. Louis, and Newark, N. J., apartments are being built with attachments to permit the use of radio in every apartment, and I believe that this will eventually be done all over the country.

When queried as to whether the song writers and phonograph people do not derive benefit from the advertisement that they gain through the broadcasting of the songs and music he replied that the benefits were negligible.

New Scientific Term

TWO young chaps with the usual boyish interest in scientific achievements were discussing an enunciating device used in a certain London store.

"It yells out the day's bargains," one explained. "They call it a stentorphone.'"

"Aw, we have one of those at our house," replied the other boy, with a twinkle. "We call ours 'Ma'!"

Young Hopeful Learns the Code

Little Johnnie was just learning the radio code, and, after the habit of the animal, was practicing most of the time somewhat as follows: "Dit-dit-dit, dit-dah, dah-dit-dah-dah." This finally got on his mother's nerves, and she asked him to stop, saying: "Johnnie, if you don't stop dittling I am going to dah-day you, and then tell your father, who'll dah-dee you so that you will be all dahed out of dum-dum."

National Radio and Electrical Exposition, San Francisco

THE National Radio and Electrical Exposition, which will be held in the Civic Auditorium, San Francisco, April 3 to 8, 1923, has been endorsed by the local electrical organizations by unanimous vote. They have agreed to co-operate in making the show a success.

The personnel of the San Francisco advisory committee, headed by J. C. Johnson, includes Louis F. Leurey, president of the San Francisco Electrical Development League; J. Mahoney, secretary and treasurer of the San Francisco Electrical Development League; H. C. Hopkins, president of the Pacific Radio Trade Association; R. E. Fisher, vice-president of the Pacific Gas and Electric Company; Earl Brown, president, California State Association of Electrical Contractors and Dealers; O. H. Miller, vice-president, Pacific Radio Trade Association; Victor Lemoge, president, San Francisco Association of Electrical Contractors and Dealers; Arthur Rowe, Garnett Young Company; Max Lowenthal, secretary and treasurer, Pacific Radio Trade Association; R. D. Oyler, treasurer, California State Association of Contractors and Dealers; A. H. Halloran, editor and publisher, *Radio Magazine;* E. Martin, vice-president, San Francisco Association of Electrical Contractors and Dealers; J. W. Redpath, secretary, California State Association of Electrical Contractors and Dealers; Clyde Chamblin, president, California Electrical Construction Company, and A. Elkens, secretary, San Francisco Association of Electrical Contractors and Dealers.

Already reservations for approximately 75 per cent. of the total number of booths have been received by Mr. Johnson, who further advises that plans for the exposition will be completed in a few days, when work on the decoration of the Auditorium and the construction of booths will be started.

Dr. DeForest's "Phonofilm" Demonstrated

THE "phonofilm," a device which reproduces sounds synchronized with motion pictures, was demonstrated last week by its inventor, Dr. Lee De Forest. Dr. De Forest uses a standard motion picture camera and projection machine with his sound recording and reproducing attachment. In recording sounds a transmitter is used which transforms the sounds into electric waves. These waves are amplified and modulate an oscillator, connected with which is a gas-filled tube, called the photion. The intensity of the light in this tube varies according to the modulations of the oscillator, and its variations are recorded photographically on the margin of the film. In reproducing the sounds the process is reversed. Dr. De Forest will shortly demonstrate the phonofilm before the New York Electrical Society, and after that in a New York motion picture theater.

French Experts on Track of Wildcat Radio Station

FRENCH radio experts are convinced that it is a British or an American station which sends out only 400-meter wave lengths and sometimes jams the programs from the Eiffel Tower. These experts are convinced that it is not a German station, as at first suspected, since the voice of the sender is heard frequently breaking in with remarks in English. The sender violates radio rules by not giving a symbol, but military observers are adapting an apparatus to measure wave lengths and the direction from which they come, with the intention of complaining officially of the existence of the "zero" post.

WOULD YOU LIKE TO RECEIVE RADIO LITERATURE?

Are you in the market for radio goods of any kind, either as a consumer, a distributor or a retailer? If so, send us your name and address on a post card and we will see that your name reaches the right people so that you will receive pamphlets, circulars, etc., regarding the goods you want.

ADDRESS SERVICE EDITOR, RADIO WORLD, 1493 BROADWAY, NEW YORK CITY

The First 50 Years

"The first fifty years are the hardest."

In publishing, the first year is generally the hardest. Starting a new publication without a reader or an advertiser is a REAL undertaking—and what makes success? We believe it is giving the most valuable information in the most interesting form.

RADIO WORLD'S first subscribers mostly took it for three months at $1.50. At the end of 90 days came our first test—would they renew? To our agreeable astonishment 90 per cent. of them renewed but not for three months but sent their little six dollars for a year's subscription.

Our weekly increase in circulation is now averaging from fifteen hundred to two thousand, and if we can only hold out at this rate for fifty years RADIO WORLD will have the largest circulation of any weekly in the world. Even today at the end of our first year RADIO WORLD is the most profitable medium to our advertisers, and gives as good, often better, returns than the older monthly radio publications, which charge two or three times our advertising rates.

Readers, we thank you, and by the same token we ask you to suggest how we can make RADIO WORLD more interesting to you. Write and tell us your radio problems—what you want to know most, tell us of the articles you like, and especially tell us of the ones you don't like or disagree with—and so make RADIO WORLD for the coming year truly YOUR Radio Weekly.

It will continue to be our endeavor to give you ALL the news in radio from one to six weeks in advance of any of the radio monthlies.

Commercial Broadcasting in Germany

AFTER four months of experimenting the Express Service Company (Eildienst Gesellschaft), Berlin, has begun a daily service of financial and commercial news broadcasting to subscribers in various parts of Germany, according to a report to the Department of Commerce from Consul E. V. Richardson, Berlin. This company is financed by German capital, and is purely a private undertaking. Having arranged with the national government for the use of the radio station at Koenigswusterhausen on a limited basis for a definite period, a regular service of financial news is received from the United States, Switzerland, Sweden, and other countries, via the high-power station at Nauen, Germany.

This information is broadcast immediately by radio telephone to subscribers of the company. These number at present about 800, and are mostly banks and industrial institutions located in some 200 towns and cities. It is expected that New York quotations handled by this service will be available generally to subscribers within ten minutes of their dispatch from New York.

Each subscriber rents from the company the necessary receiving apparatus, paying for the service itself an annual fee of 300,000 marks, and for the apparatus an annual rental of approximately 200,000 marks. There are 2½-hour schedules daily, beginning at 9:30 a. m. and 5 p. m. The Express Service Company is represented in New York by a large American news agency.

Cuba and California Answer "Roll Call" in Chicago

CHIMES in Havana played "Home, Sweet Home," and a violinist in San Francisco gave a solo on a recent night for an audience in Chicago in a demonstration of overhead, underground and submarine telephone cables, and the wireless telephone.

Twenty cities from the Pacific Coast to Cuba answered when General John J. Carty, vice-president of the American Telephone and Telegraph Company, conducted a "roll call" during an address on world communications. As each station answered a light flashed upon a giant map, and the far-away operator, his voice magnified by amplifying devices, spoke to the Commercial Club. Among cities answering the roll call were Richmond, Va.; Philadelphia and Pittsburgh.

Radio Does Change 'Em

CHARLES M. SCHWAB recently delivered an address in New York which was heard by his mother in Loretta, Pa., via radio. And afterward, it is said, she wrote: "Charlie, you don't seem to be the same boy you were fifty years ago."

Second Edition of "Radio Constructor"

THE second edition of the "Radio Constructor" is a valuable book for all radio enthusiasts to have handy. Not only is it right up to the minute with the most recent developments in hook-ups, but it also embodies special features to be found nowhere else. Full details are given about the following types: Regenerative set with two-step amplifier for the W-D 11 tube; short-wave regenerative tuner and amplifier in separate units; radio frequency two-stage amplifier; honeycomb receiver and amplifier; long-distance receiver; reflex amplifier; Reinartz tuner, and the Flewelling circuit.

In addition to the plans and description, the maker of the set is supplied with a complete panel layout containing full dimensions. This makes it extremely simple for the builder of the set to lay out his panel without waste of time and patience.

Another excellent feature is a complete list of all the broadcasting and mercantile stations throughout the United States and Canada, listed in alphabetical order. This enables the listener to tell at a glance exactly what he is capable of receiving with his particular set. With its valuable text, diagrams, and information, no fan should be without this book.

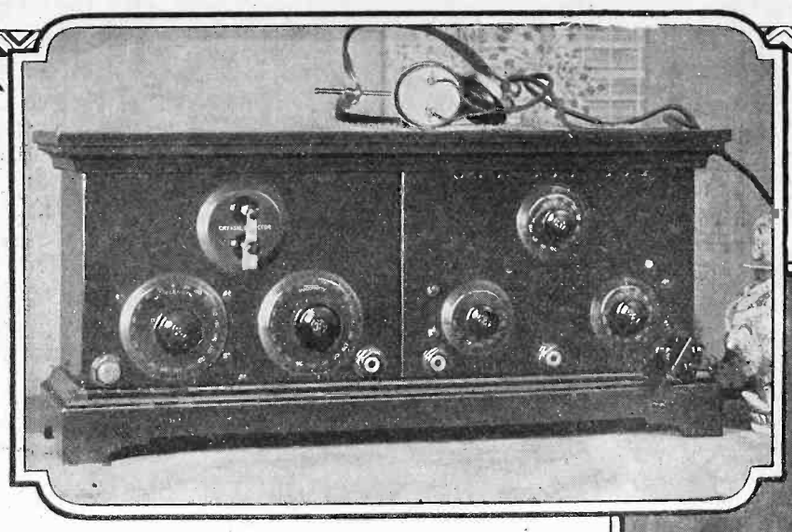
Explanation to Advertisers

A considerable number of advertisements for this Anniversary Number of RADIO WORLD were received too late for publication.

The extra large edition required to meet advance orders necessitated going to press promptly. Therefore, it was incumbent upon the publishers to omit advertisements not received according to schedule.

These omissions are regretted, and it is hoped that advertisers in the future will adhere to publication time schedules, which are becoming more exacting as the circulation of RADIO WORLD is steadily increasing.

BUSINESS MANAGER, RADIO WORLD

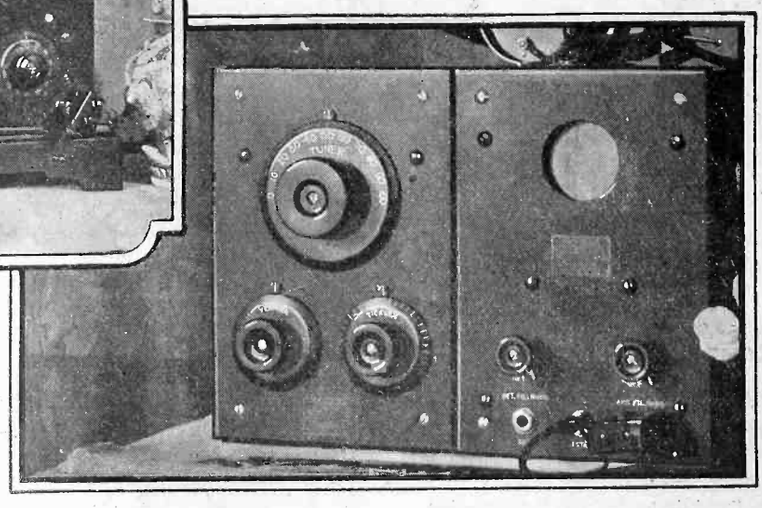


Radiola V

Radiola V is built for a life time—solidly—ruggedly. In principle and performance, it is the same as Radiola RC—detector with two stages of audio amplification. With the same long distance reach. And the same keen sensitiveness. A pleasing and unobtrusive piece of furniture in its neatly finished casing. Dependable always—and simple enough for any one to operate.

Radiola RC

Radiola RC is one of the nation's most popular long distance receivers. Compact—efficient—with a sensitive detector, and two stages of amplification, for louder, clearer reception of distance. Finely made—and attractively finished—of solid mahogany.



A New Improvement Lowers the Cost!

Dry Cells Replace Storage Batteries

A new vacuum tube has made it possible. Radiola V and Radiola RC have been topping them all in popularity for dependability and long range—receiving over thrilling distances—up to 1,500 miles and more. Now both are converted to dry battery operation. This means greatly lowered cost—does away with bulky storage batteries—gives the far-away farmer the same good service it gives the city man.

No more need for expensive storage battery and charger. A big saving! And a saving made greater by the new offer—a combination offer of receiver and accessories—complete at a price remarkably low.

"There's a **Radiola** *for every purse"*

at the nearest Radio or Electrical Store

Radiola

REG. U.S. PAT. OFF.

Radio Corporation of America

Sales Department
233 Broadway
New York

District Sales Offices
10 So. LaSalle Street
Chicago, Illinois

433 California Street
San Francisco, California

This symbol of quality is your protection

Radiola V *or* Radiola RC Complete $142.50

The New Way: Complete for dry battery operation, including three WD-12 Radiotron vacuum tubes; head telephones; "A" battery consisting of three dry cells; "B" battery consisting of three 22½ volt units. $142.50.

The Old Way: The price of Radiola V or Radiola RC when equipped for storage battery operation, formerly came to $207.50.

Send for this Free Booklet

If you can't have a $350 Radiola—want something bigger than a $25 Radiola—write for the booklet. Plenty of in-between sets. The booklet tells all about 'em.

RADIO CORPORATION OF AMERICA
Dept. 2094, 233 Broadway, New York
Please send me your free Radio Booklet.

Name _____

Street Address _____

City _____ R.F.D. _____

State _____