

15c. a Copy

Vol-3  
No-73

August 18 1923

\$6.00 a Year

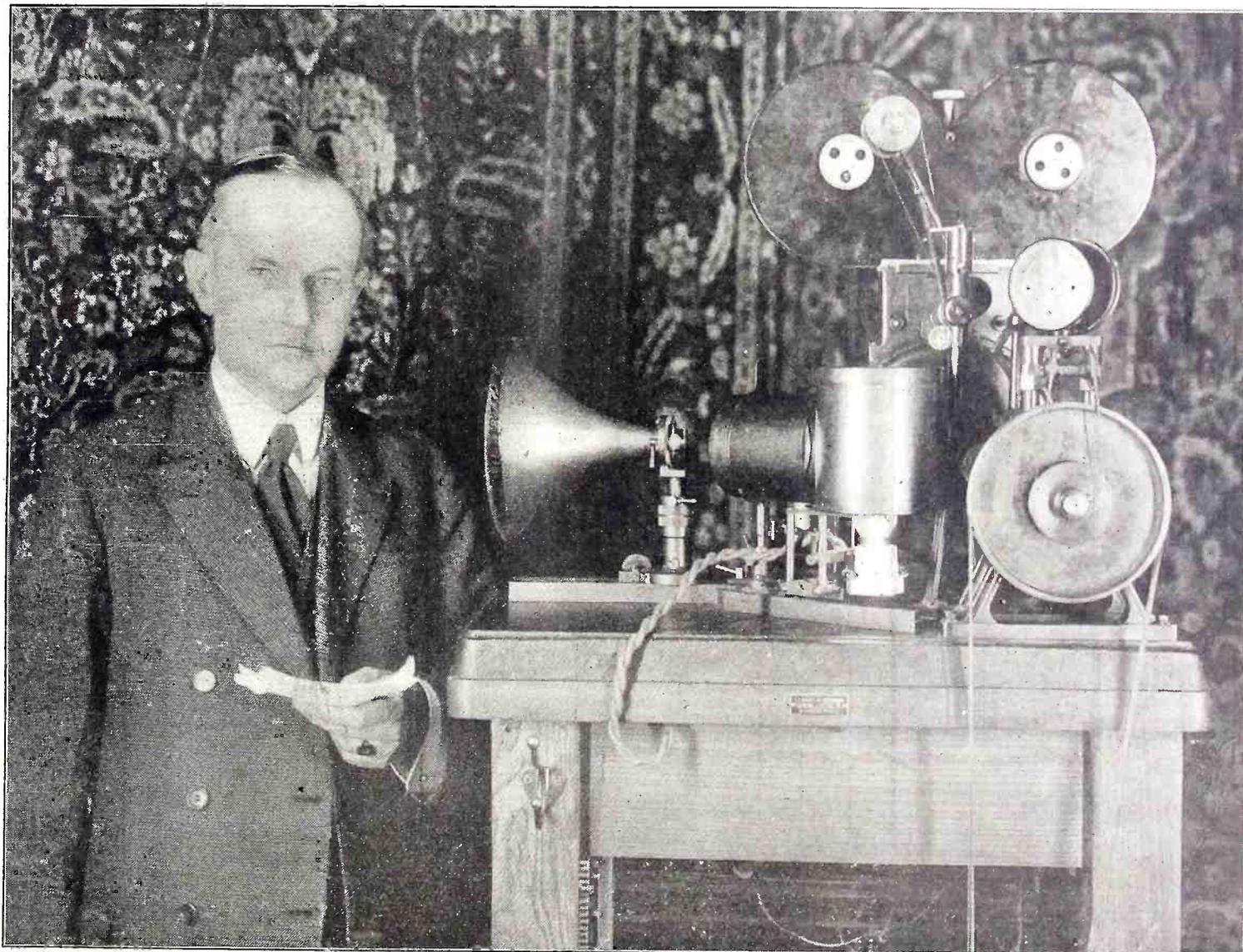
# RADIO WORLD

Title Reg. U. S. Pat Off.

**ILLUSTRATED**

**EVERY WEEK**

**PRESIDENT COOLIDGE IS A BELIEVER IN RADIO**



President Coolidge, who is very much interested in radio and all modern scientific development, some months ago delivered an address from Station WGY, Schenectady, N. Y., while in person he was really in Washington, D. C. The means which made this feat possible was the "pallphotophone," a General Electric device which records speech on a moving film, which may be shipped to a distant point and the original speech broadcast from the film by radio

**BROADCASTING STATION AT SAN JUAN, PORTO RICO (See Inside)**

## HEAR 2000 MILES ON ONE TUBE!

Easily made by anyone. No trick circuit. Few parts. Distance, Volume, Selectivity.

**GUARANTEED TO WORK**

Complete parts, including drilled panel, genuine mahogany cabinet, phones, batteries and diagram only .....\$12.95

*Circular Free.*

**Scientific Radio Laboratory**

25, THIRD AVENUE NEW YORK



## WE REPAIR RADIO TUBES

WD-11....\$3.50	UV-199...\$3.75
WD-12.... 3.50	UV-299... 3.75
UV-200.... 2.50	UV-201A. 3.75
UV-201.... 3.00	C-301A... 3.75
C-300.... 2.50	UV-202... 4.00
C-301.... 3.00	C-302.... 4.00

Mail orders solicited and promptly attended to.

**H. & H. RADIO CO.**

P. O. Box 22-B

Clinton-Hill Station Newark, N. J.

## YOU SAVE 50% OF THE USUAL COST



### WORLD RADIO

*Batteries Are Guaranteed 2 years in Writing*  
Will ship C. O. D. subject to inspection, or allow 5% discount for cash with order. Order shipped same day received. WRITE TO DAY.

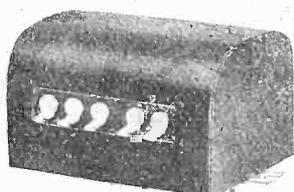
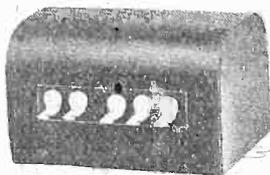
World Battery Co.  
Dept. 17  
1219 So. Wabash Ave  
Chicago, Ill.

2 VOLT STORAGE BATTERY for  
WD11-WD12 \$5.00  
6 V., 80 Amps. \$10.00  
6 V., 80 Amps. 12.50

6 Volt, 100 Amps. \$14.50  
6 Volt, 120 Amps. 16.00

## COMO DUPLEX TRANSFORMERS

The COMO DUPLEX SYSTEM of audio-frequency amplification gives the maximum volume without distortion and tube noise.



Type "I" Type "O"

**COMO APPARATUS COMPANY**

168 DARTMOUTH STREET BOSTON, MASS.

There is a combined filtering action which assures perfect results when ordinary amplification fails.

It can be added to your present amplifier, giving you power amplification on the weak signals that more of the ordinary amplification would kill.

Sold only in matched Pairs, \$12.50

A copy of C. White's "HOW TO MAKE A POWER AMPLIFIER" is yours for the asking.

## Westinghouse Stations Stand By on Friday

THE three Westinghouse broadcasting stations, KDKA, Pittsburgh, Pa.; KYW, Chicago, Ill., and WBZ, Springfield, Mass., suspended their entire broadcasting programs on Friday, August 10, National Mourning Day throughout the United States in honor of President Harding.

These stations remained silent during the whole day with the exception of Station KDKA, which broadcast a memorial service between the hours of 8 and 9 p. m. Many broadcasting stations throughout the country followed this action as a tribute to our late President.

## Gen. Dawes in Tears as He Radios Harding's Praise

BROADCASTING his tribute to the late President Harding from the Edgewater Beach Hotel, Chicago, Gen. Charles G. Dawes broke down and cried as the final words died on his lips. He buried his face in his hands and his sobs went out to the mourning nation.

Gen. Dawes, who was called to Washington at the beginning of the Harding administration to establish the national budget system, completely won the President's confidence and was perhaps Mr. Harding's most intimate friend in Chicago.

Waiting his turn to speak, the man who made the "Hell and Maria" exclamation famous, was visibly under a heavy strain. When called he sat down at the microphone at Station WJAZ with grim determination on his face and began. His voice remained steady until near the end, when he referred to the love and companionship of President Harding and his devoted wife. Then his chin quivered and his voice broke. The few guests in

the radio station sat in respectful silence until Gen. Dawes lifted his tear-stained face and arose with jaws set, again the soldier. He walked silently out of the little curtained room to a distant part of the hotel, glancing neither to right nor left, nor speaking a word until his wife, who followed, reached his side.

## Station WBZ Broadcasts Harding Memorial Services

TWO memorial services by radio were the tribute paid to the late President Harding by Westinghouse Radio Station WBZ, Springfield, Mass., on Friday last; one in the afternoon at 2.15, broadcast from the city of Springfield Auditorium, and the other from the Kimball Hotel Studio at 8.00 p. m.

In the afternoon, the services began with ten selections on the Municipal Chime played by Bell-ringer Ernest N. Bagg. The first number was "America" and the last, "Taps." The numbers intervening were the President's favorite hymns.

After the chimes called the people of Springfield to the service, Municipal Organist Arthur Turner gave a number of appropriate selections. The meeting was opened by Acting-Mayor Frank Kinney, and prayers and addresses by prominent ministers and men of Springfield followed.

Microphones in the hall picked up the music and speeches and they were sent to East Springfield to the radio station where they were broadcast.

In the evening a similar service was given which allowed the people at distant points to hear the service. It was conducted by Rev. Stanley F. Blomfield and the music was furnished by the Springfield Conservatory of Music.

The regular musical program scheduled for the evening as well as the business talks and bedtime story for the children were cancelled so that due homage could be paid to the late President.

## Forthcoming Program at WGY

SUNDAY morning, August 19, the Rev. Dr. George Alexander, pastor of the First Presbyterian Church of New York, will deliver the sermon at the service of the First Presbyterian Church of Schenectady, to be broadcast by WGY, the General Electric Company radio station.

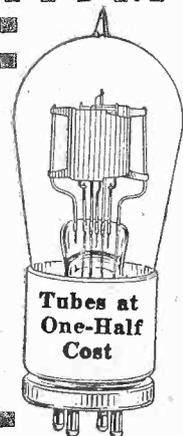
For the convenience of farmers WGY has made changes in time schedule of produce market reports, harvest and regular weather forecasts. These reports will be sent out from 12:01 to 12:20, eastern standard time.

Ray Halse's orchestra will offer a program of popular dance music Monday evening, August 20.

Members of the WGY Players will present a Shakespearean program Tuesday night, August 21. Readings from "Midsummer Night's Dream," "Romeo and Juliet," "The Merchant of Venice" and "Twelfth Night," will be given.

Thursday evening Rogers Whitmore, a young violinist of Iliou, N. Y., will be featured. Mr. Whitmore was awarded the prize at the Fontainebleau Competitions in 1922. Jud Landon will give one of his popular open-air talks on the same evening.

A feature of the program Friday evening, August 24, will be the appearance of Adelbert Purga, thirteen-year-old violinist. At the 10:30 o'clock program on the same evening, Pietro Della Ratta will give several numbers on the piano accordion.



## IT HAS HAPPENED TO ALL OF YOU IN A FRACTION OF A SECOND!

WHEN the filament burns out, at least \$5.00 goes with it to put the set in operation again.

WHY not save nearly one-half the cost of a new tube by sending us your burned out or broken tube to be repaired?

WE REPAIR EVERY TYPE OF tungsten wire filament receiving tube. All our tubes are TESTED and GUARANTEED to function as well as when new.

All tubes returned P. P., C. O. D.

**HARVARD RADIO LABORATORIES**  
BOSTON P. O. BOX 1781 MASS.

# RADIO WORLD

[Entered as second-class matter, March 28, 1922, at the Post Office at New York, N. Y., under the Act of March 3, 1879]

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.

Vol. III, No. 21. Whole No. 73

August 18, 1923

15c. per copy, \$6.00 a year

## Construction Details of My Midget Set

By Dick Roberts

**I**N response to many requests, received personally and by RADIO WORLD, for the circuit diagram and constructional details of the midget set described in RADIO WORLD, July 21, 1923, I am furnishing all the necessary details with circuit diagram so that any of the readers of the magazine may, with the aid of the pictures and circuit, build the set.

The coil is bakelite, 2" in diameter and 2" high, wound with 80 turns of No. 28 wire. It does not matter much what insulation is used as long as it is safe. Tap every eighth turn, and after winding 56 turns start back on the coil and wind 24 turns more over the first 56, tapping as before. The last turn of wire will be about half way down the coil, and the antenna is connected to the last turn of that second winding.

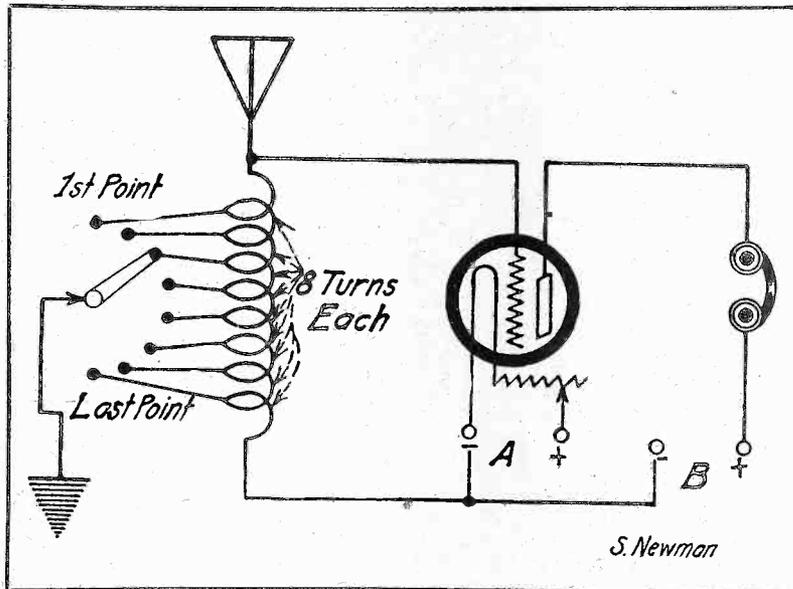
Great care must be taken if success is wanted to see that there is no chance of a short circuit. The set being built in such small proportions, it necessarily crowds everything and makes it hard to make all the wiring safe, if the utmost care is not taken.

As for the particular apparatus employed I used a Signal socket mainly because it was the only one that I could get in town that had a base and terminals that would allow such construction. The rheostat is a Fada with a 2" dial. Any switch lever will do, but should necessarily have a small arm. The switch points are the ordinary tap points, but the rear extensions are cut short, after they are fastened on by means of the nut. If this is not done, they will protrude and interfere with the placing of the coil. The jack is a Chelton, with part of the insulation cut off to prevent it from hitting the coil. The binding posts are the smallest ones I could get and were purchased at a local Five and Ten Cent store. The panel is a piece of hard rubber taken from an old storage battery jar, although any panel material can be used.

In operating the set it will be found that the right amount of B battery will have to be found according to the particular tube used. With the tube I used

(UV200) I found that about 18 volts were correct when the battery was new, moving the tap as the battery ran down. Particular care will have to be taken with the filament current, as it is important in the tuning of the set. Stations that cannot be heard with one adjustment can be brought in simply by varying the filament voltage. I found that stations within 400 miles come in on the third to fifth tap, according, of course, to their wave length. Kansas City, Mo., comes in on the third tap, and St. Louis, Mo. (both the same distance), comes in on the tenth tap. Volume of the signals can be varied by both the switch and the filament.

Too much care cannot be taken in the construction of the set if good results are wanted. I personally took an entire night planning the efficient wiring of the set before I heated the soldering iron, and then wired it up just as I had planned. Due to the fact that the set is small there are plenty of ways of wiring it, but the builder will, if he thinks, find one or two ways that will probably enable him to use an inch or two less wire, and that will increase the efficiency of the receiver.



Circuit used in Dick Roberts' midget set. It is the conventional straight audion circuit using a tapped coil for inductance. If care is taken in the construction and wiring, a very neat and capable set will be the result.

## Paraffine Is Useful

**M**ANY fans do not realize that paraffine is extremely helpful and useful around a radio set. Its use will sometimes improve reception many times.

Instead of shellacing the windings of coils, dip them for a moment in paraffine that is boiling hot, and allow them to drip until all the excess paraffine has been removed and there is just enough to hold the windings firm.

Instead of spaghetti for insulation, especially around a receiver, the use of a roll of tubular tape, such as can be obtained at the five and ten cent stores, and which women use for drawing strings, if dipped into paraffine and left to dry is suitable, and much cheaper.

# Radio Broadcasting Station WKAQ San Juan, Porto Rico

By J. Agusty

**W**KAQ is the radiophone broadcasting station of the Radio Corporation of Porto Rico, affiliated with the International Telephone and Telegraph Corporation of 41 Broad street, New York. It is located in the center of the city of San Juan, Porto Rico, and its geographical position is Latitude North  $18^{\circ}-25'-4''$ . Longitude West  $66^{\circ}-6'-57''$ .

The station occupies four rooms—the studio, reception, operating and power rooms. The transmitter is the standard Western Electric 500 watt with two 250 watt oscillators and two 250 watt modulators. There is also a 50 watt speech amplifier. Actual radiation

each of these lights there is a framed notice which reads: "When the red light is on, the slightest sound is picked up by the microphone and broadcast. Please keep quiet."

In the operating room are located the transmitter which includes the speech input amplifier with its monitoring horn, the power panel to control the power, the regular transmitter and the receiver. This room is the place for the operator in charge of the station.

The reception room in this station is also the office of the station's manager. Here the artists who take part in the program await the call to the studio.

The power room is apart from the studio to eliminate all possible noises. Here an Ecko motor-generator of three units, supplies the necessary power for the transmitter. There are two sets of Exide batteries to light the filaments of the speech input amplifier and receiver tubes. Also the batteries supplying the plate potential.

WKAQ has been heard in every state of the United States, Canada, West Indies, Mexico, Central America and South America. An interesting thing is that most of the letters received indicate that this station has been heard perfectly clear through the roar of the broadcasters in the United States.

Porto Rico is now an established part of the radio world. It had already joined the mainland by amateur radio telegraphy through the remarkably efficient efforts of the local division of the A. R. R. L. And now just as our sister island Cuba has carried the music and the spoken word of Cuba into our world-wide common property, the ether, so has WKAQ introduced Porto Rico to the broadcast listeners of this hemisphere.

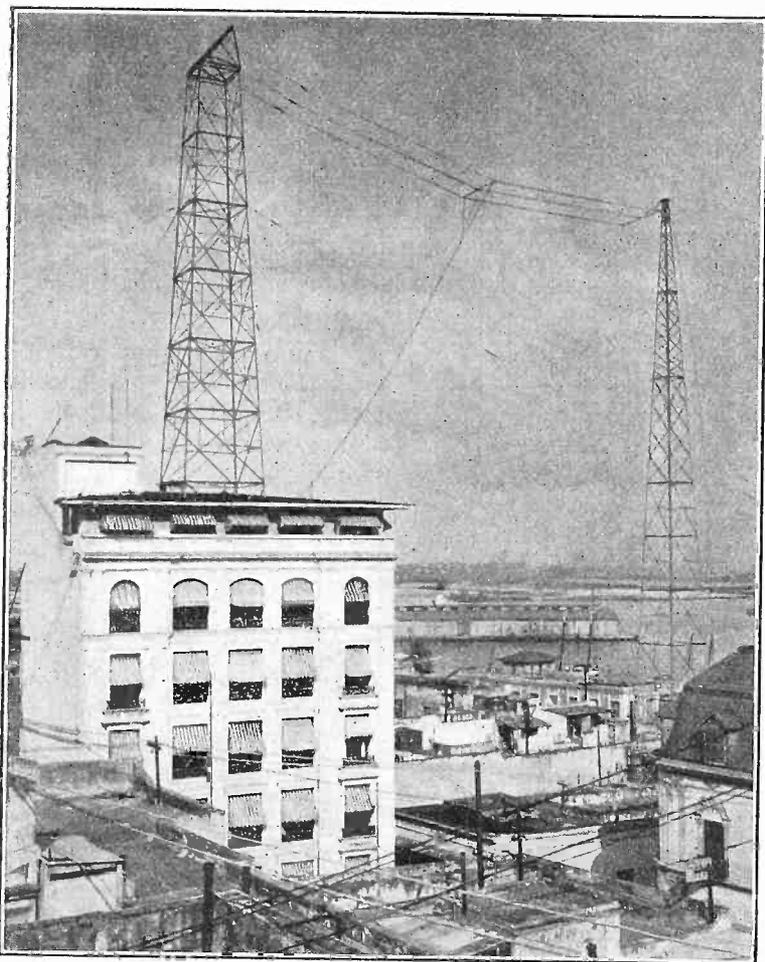


Fig. 1. Towers and antenna of Station WKAQ, San Juan, Porto Rico. The station is owned by the Radio Corporation of Porto Rico and is located on the roof of the telephone building.

on 360 meters is  $6\frac{3}{4}$  amps. The well-known system of modulation is used.

The station is situated on top of the telephone building. On the roof is a steel tower 87 feet high supporting one end of the three-wire antenna that runs 90 feet horizontally to another tower 187 feet above the street level. The lead-in comes from the center, giving a "T" type aerial.

The first broadcasting was done in August, 1922, but the official inauguration was held on December 3, 1922.

The studio of WKAQ, similar to all broadcasting studios, is a room different from all ordinary rooms. Walls and floor are covered with heavy curtains and carpet to deaden echo. In one corner near the ceiling is a red lamp which is in series with one in the reception room and another in the operating room. Under

## Radio Reports the President's Death

By Carl H. Butman

**W**ASHINGTON, D. C.—For the first time radio played an important part in the dissemination of news of a national character, when President Harding died in San Francisco on August 2. The President's death occurred at 7:30 p. m., Pacific time, and the Associated Press had the story out within five or ten minutes, the report being received at the Washington office of that organization at 10:55 p. m., Eastern standard time, or 25 minutes after President Harding died.

The first intimation the general public had of the President's death, however, was when various newspapers having broadcasting licenses sent out the Associated Press dispatch. Among the first papers to get on the air with this important news was the *Memphis Commercial-Appeal*, whose announcement was the first word Washington listeners-in had of the event.

The news by air that the President had died, resulted in a great number of telephone calls to the newspapers and various offices of the Associated Press throughout the country. As a result of the broadcast announcement, the news of the President's death was generally known from 30 minutes to two hours before the newspapers in the larger cities were out with extras.

# Army and Navy to Use Radio in War Games

By Washington R. Service

WASHINGTON, D. C.—Assistant Secretary of the Navy Roosevelt has a unique idea for the use of radio in army and naval war games. He proposes the joint study and solution of a problem involving combat operations, such as an over-seas expedition, by the war colleges of the army and navy simultaneously, every move being radioed to umpires meeting in the War or Navy Departments near their radio central offices.

War games are old, but Colonel Roosevelt's idea is

ence, maps, charts, etc., are available, and as fast as orders, plans and movements of troops or ships are made, to radio the action to the board of judges sitting in Washington. The army and navy officers acting as umpires would have two charts in their meeting place and plot every move made by the students at each school.

Upon the completion of the "game," which might require a week or ten days, the umpires would decide which of the schools had solved the problem correctly

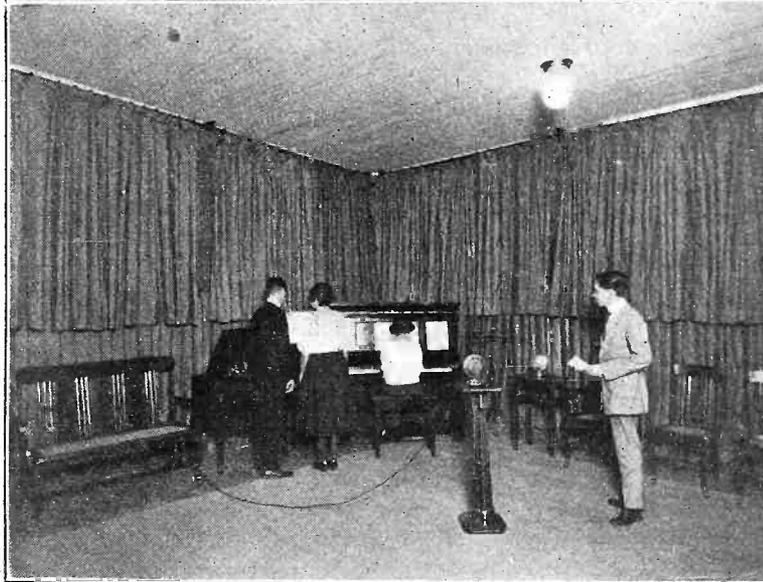
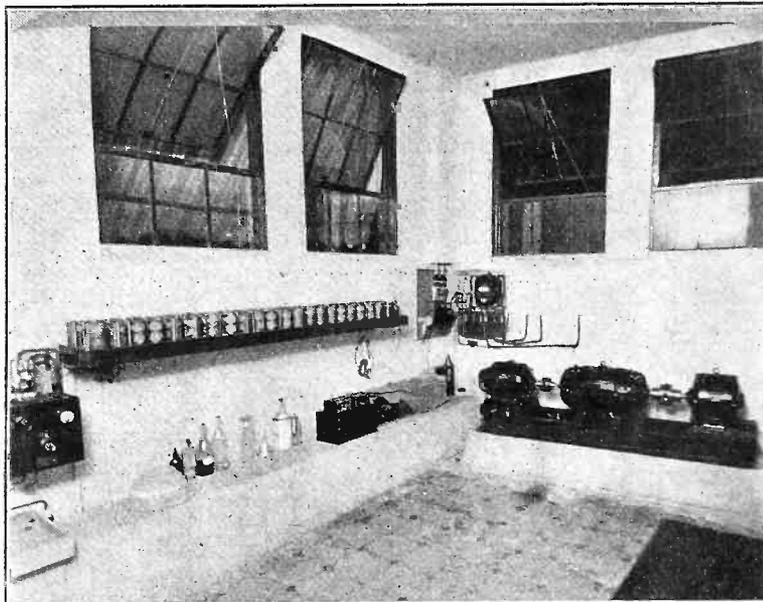


Fig. 2 (upper left). The power room of Station WKAQ, San Juan, Porto Rico. Fig. 3 (upper right). The speech input amplifier at Station WKAQ with operator on watch. Fig. 4 (lower left). Studio of Station WKAQ. J. Agusty, the author of the article on page 4, is standing near the microphone. He is also the manager, announcer and program director. Fig. 5 (lower right). Operating room of Station WKAQ, with Operator Camuñas checking the wave length.

to bring the land and sea postgraduate war schools into a closer relationship during peace times when they have time to work out problems involving both arms. Military and naval forces would be operated theoretically on paper, just as they would co-operate in time of war.

Since the Naval War College is located at Newport, R. I., and the War College of the Army in the Capital, it would be expensive and difficult to bring all the students into one large hall for the joint study of intricate war operations. Therefore, he suggests that the students remain in their respective class rooms, where all facilities such as books and tables of refer-

or to the best advantage and announce the result by radio to the students.

It would not be a contest between the army on one side and the navy on the other, but would involve the handling of both sea and land forces. The naval class would be divided, one handling the Red forces, the other the Blue, while the army school would also fight out the same problem, dividing against itself. Such studies, naval officials believe, would tend to familiarize naval officers with the military end of war problems and army students with the marine side of such conflicts, effecting closer co-operation and understanding of combined national defense.

# In One Year Radio Stations in U. S. Increase 1126

By Carl H. Butman

(Copyright 1923)

WASHINGTON, D. C.—The end of the fiscal year shows a gain of 1126 radio stations of all kinds in the United States, according to the Department of Commerce figures just compiled. On June 30 there were 21,967 ship and land radio stations, whereas a year ago there was a total of 20,841. The increase represents added interest among amateurs and broadcasters who have taken out station licenses during the past twelve months. Amateur stations increased from 15,504 to 16,570 on June 30, showing a gain of 1,066. Broadcasting stations number 191 more today than a year ago, having increased from 382 last year to 573. On June 30, 1923, the official tabulation was as follows:

	1923
General and restricted amateurs.....	16,570
Special amateurs .....	178
Trans-oceanic stations .....	12
General public service to ships.....	45
Point to point stations.....	179
Broadcasting .....	573
Technical and training.....	127
Experimental .....	261

Ship stations, commercial.....	2,723
Government ship, inc., Navy and Army.....	1,009
Government land, inc., 24 light ships.....	290
Total .....	21,967

Interest in amateur activities is indicated by the following table which shows the gains by districts in the past three fiscal years:

Amateur Radio Stations				
Districts	Headquarters	June 1921	June 1922	June 1923
1	Boston .....	2040	2489	2139
2	New York.....	1880	2348	2055
3	Baltimore .....	1325	1857	2005
4	Atlanta .....	208	341	449
5	New Orleans.....	418	758	948
6	San Francisco....	1136	1756	1957
7	Seattle .....	504	753	864
8	Detroit .....	1615	2354	2013
9	Chicago .....	1683	2848	3340
	Totals .....	10809	15504	16570

## Development of Broadcasting

By S. B. Davis

Assistant Secretary, Department of Commerce

WE meet tonight to welcome the youngest member of the radio family, which is to devote its life to what we now call "broadcasting," an activity so new that the word itself, in its present significance, was unknown only a few years ago. The family has been of rapid growth, but it is not of the mushroom type to flourish but a moment and then perish. We who listen nightly to the messages that entertain and instruct us accept them more or less as a matter of course, without much thought of either their mystery or their novelty; but no prior discovery has ever seized the public mind and sprung so rapidly into general popular use as has radio.

The first license authorizing a station to broadcast was issued in September, 1921, less than two years ago. Tonight, with the entry of this latest station into the field, there are five hundred seventy-three stations in this country authorized to broadcast. Born in the United States, broadcasting has largely retained its Americanism. Foreign countries have adopted its English name into their language. In all the rest of the world there are only sixty-three such stations, and of these, thirty are in Canada, our nearest neighbor. How many people receive their messages no one knows, but in our country alone they are numbered by the million. Never since the first letter was printed from movable type has such a huge stride been taken to make information freely available and to put knowledge and education within the reach of all.

Since the day when the savage sent his messages by

signal fires and beating drums man has been striving to conquer distance. He has dotted the earth with his railroads and automobiles and the sea with his ships in his effort towards the more speedy transportation of person and property, and at last for the same purpose he traverses the skies. \* \* \* Radio now supplements the telegraph and telephone; it has become the voice of ships; it bridges uncharted seas, and spans unsurveyed distances on land. It brings the church, the market, public speech, music and instruction into our homes. This most scientific of modern discoveries has become a household factor of common use. The human voice carries with it the elements of personality, force and earnestness, vital to any plea, far more effectively than does the printed word.

Broadcasting conveys the expressed thought of one to the minds of many. It is a unique means to that end, and it is unique again in that, in most instances, whatever future development may be, it now has small direct commercial value. Measured in dollars and cents of profit to the transmitter its worth in most cases is small; measured in terms of service its value cannot be calculated. I doubt if there is in the world another activity involving so great an effort in science and invention and such an immense actual expenditure of money in installation and maintenance, not founded on the expectation of immediate financial profit.

Under existing laws, enacted by the way, some years before broadcasting had been heard of, our government regulates the transmission of radio messages of all kinds. At first devoted largely to the protection of life at sea, that regulation of late has been particularly

(Concluded on page 10)

# A Little Wonder Portable Set

By Byrt C. Caldwell

**T**HIS wonderful little set is easily constructed and gives results equal, and usually better, than full-sized sets. This is due to its extreme compactness. The U. V. 199 and C. 299 make this set possible.

The first requirement is the containing box. It should be made from quarter-inch stock, and should be about 3"x5"x7" outside dimensions. All the instruments and binding posts are mounted on this, and the heads of the screws should be countersunk and the holes filled up with filler. It should then be sanded, varnished, and polished. Or it may be finished by covering with black velvet. Either way makes a beautiful set.

The inductance is a 50 or 75 turn spider web coil, which can easily be constructed from instructions to be found elsewhere. It is fastened to the bottom of the box. The condenser is of the book type, as compactness is required in this set. It is placed on top of the inductance. The shaft projects through the side of the box, and a small knob is used instead of a dial.

The tube is mounted on the side of the box, and the variable grid leak and condenser, the rheostat, and the "A" battery, which is a 4½ volt flashlight battery, are placed as shown.

The "B" battery consists of eight 3-volt flashlight batteries connected in series, and fastened to the cover of the box as shown, by means of thin strips of brass. This battery is connected to the rest of the set by means of flexible wire, so that it is not broken when the box is opened. When mounting these, be careful

The phones are to be connected to the two binding posts shown. They must be carried outside of the set, unless a pair of the very small sized phones which are seen on the market are used, in which case, plenty of room on top of the movable condenser plate and the rheostat may be found for the phones.

When the set is to be used, unwind the spools of wire, string one as high as possible, and connect it to the upper binding post in the diagram. Suspend the other a few feet from the ground, and connect it to the other post. Then light the filament and tune with the condenser in the same manner as you tune your large set, provided, of course, that you tune this properly.

The same general rules for wiring all sets apply in this set as well. The only difference is that there is a better opportunity in this set for short straight leads than in a large set where the instruments are spread all over a panel. The wiring is not shown in the

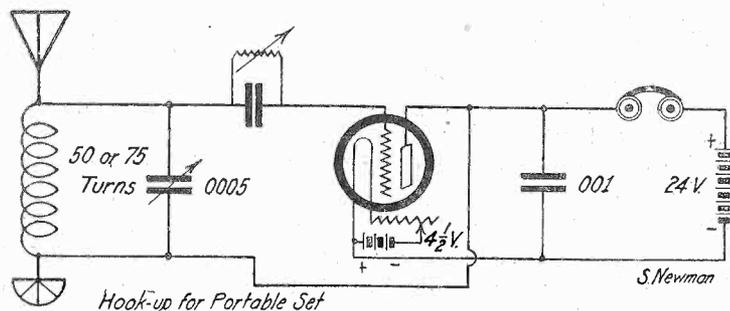


Fig. 1. Diagram of circuit used in the little portable set described herewith. It is the ultra-audion circuit which is very selective and easy to control.

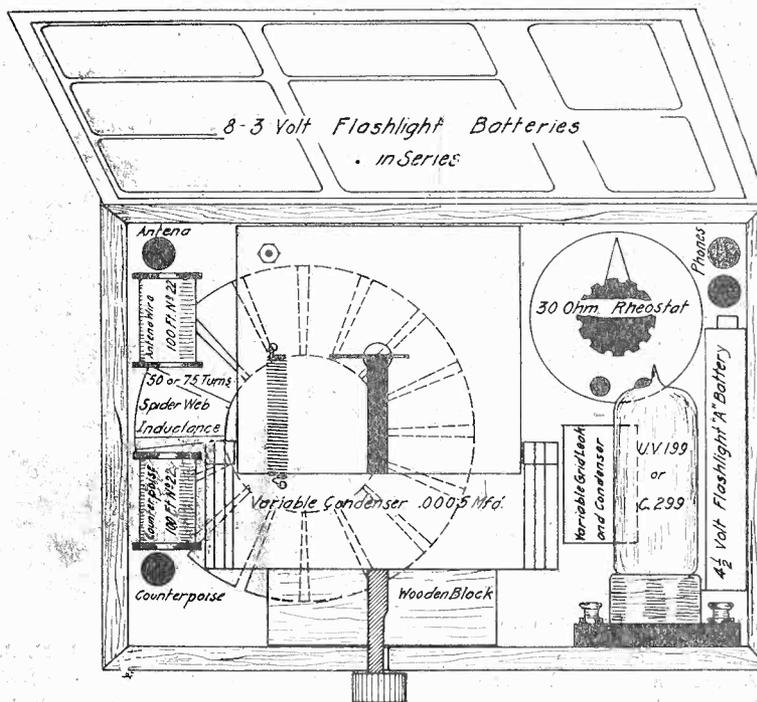


Fig. 2. Layout suggested for the receiver described. The batteries can be placed in the cover of the box and connections made with flexible wire.

that they do not touch the edges of the box, or any of the instruments when the box is closed.

In this set, a counterpoise is used in place of a ground, as being more efficient and more convenient. Two 100 foot lengths of No. 22 enameled wire are wound, each one on a spool, and placed in the box as shown. Heavy elastics are used as insulators. The wire specified should be insulated, so that in case the antenna touches a tree or some other conductor when it is hurriedly strung up, there will be no loss of energy.

diagram, as this would probably lead to confusion. The hook-up given is the usual single circuit regenerative. The set is easily wired from this hook-up.

This set is one of the most easily constructed you can imagine, and it gives wonderfully consistent results over distances of a thousand miles and more. The new peanut tubes make it possible to construct this beautiful little completely self-contained set which fits into a pocket, and yet gives results equal to the most elaborate of home sets.

## Do You Dust It?

**S**UMMER time is lazy time. You are naturally lax in all things, but you should not forget to use the dust cloth and duster on your set. If dust collects, it will short the set and cause innumerable little by-paths for the minute currents, and your receiving range will be cut down enormously. When working inside the set it is best to blow the dust out with a rubber tube, as then you will not chance breaking wires.

## Painter, Attention!

**T**HERE are many amateur builders who, after they have constructed a set, will give the cabinet and base a healthy coat of nice looking finish. Nine times out of ten the paint contains some lead, zinc or other metallic oxide which will form a nice leak for the set. Clear varnish, or shellac, is best for this purpose—or alcohol stain and wax polish for the finish.

# Invisible Singers Entertain Boy Scouts by Radio at Camp Glen Gray

By Gilbert Bonnell

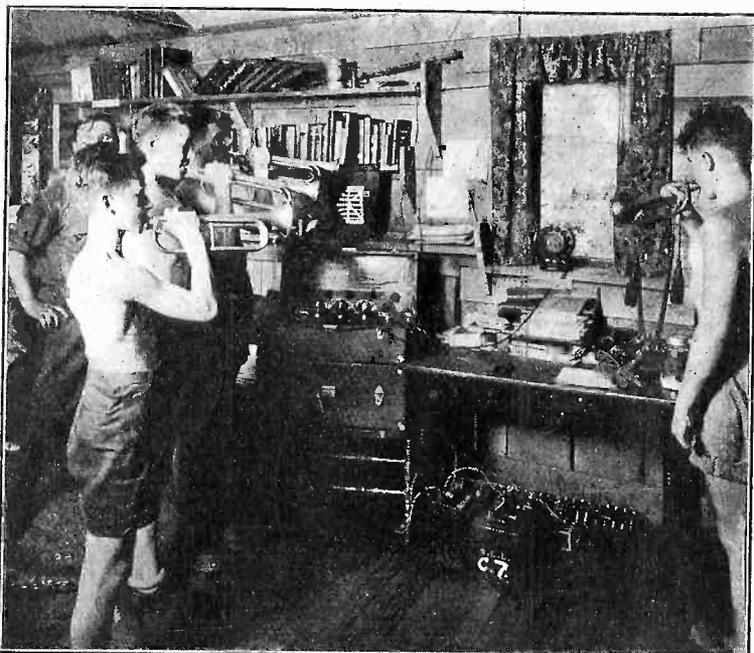
**R**ADIO is the great boon of boys, particularly those who are members of the world's largest boys' organization, the Boy Scouts.

Boys are ardent radio fans; they find rare enjoyment and entertainment in the ether, they sport with its waves as do skillful swimmers in the sea.

Radio has done more than anything else to relegate lurid dime novels to the limbo of discarded things, for its popularity with young America has brought into being the excellent publications that boys read avidly.

Radio justly deserves the important place it occupies in Boy Scout camps throughout the length and breadth of the land.

A notable example of how radio plays a leading part



(C. Western Electric Co.)

Bugle call at Camp Glen Gray, the Boy Scout Camp at Oakland, N. J. A Western Electric Public Address System amplifies the bugle calls so that they are heard all over the camp. In the picture are Gordon Gavan, of Montclair; Douglas Pease, of Upper Montclair, and Edw. Veleau, of Montclair, N. J.

in the program of the camp day is at Camp Glen Gray, the Montclair Council Camp in Bergen County, New Jersey.

There in the Ramapo Hills where the red man's watchfires once gleamed is the campfire of the first Boy Scout troop organized in the United States.

Around that campfire the Boy Scouts of Montclair, Glen Ridge and Nutley, nightly gather and listen to the voices of invisible singers miles away across the mountains. As a matter of fact the boys could as easily hear the singing in any other part of the camp for radio programs are made clearly and distinctly audible over all of Lake Vreeland and the full length and breadth of the camp situated on the lake shore.

This is accomplished by means of the Western Electric No. 3 public address system which P. M. Rainey and R. M. Hatfield, of Montclair, brought to the camp where their sons are sojourning.

This system, while compact, is capable of amplifying radio reception some several thousands of times without distortion. It is a vacuum tube amplifier similar

to, but smaller than the one which made President Harding's inaugural speech audible to the largest assemblage that ever heard any inaugural. It is mounted in a hardwood cabinet containing an insulating panel upon which are mounted four vacuum tubes and the necessary transformers, resistances, condensers, switches, etc., for three stages of amplification.

The public address system may be used to amplify radio received programs or, when connected with the microphone, it may be used to amplify local speeches, vocal and instrumental music.

The microphone which picks up the voice or music is the same as that used in the larger public address systems.

A group of horns is mounted on the balcony of Mothercroft, the recreation hall at Camp Glen Gray. These horns are exactly the same as those used in the Yankee Stadium when a public address system made the announcements at the Willard-Johnson fight audible to 74,000 fight fans. The horns uniformly and distinctly carry the amplified voice or music over the area it is desired to cover at the camp.

Camp Glen Gray was established in 1917 by "Uncle" Frank F. Gray, who organized what is the oldest Boy Scout troop in this country, Troop 4.

The camp is located on the shore of a lake in the Ramapo hills, about four miles from Oakland, New Jersey. This section of the country was deserted in '49 by the settlers who went to California in the gold rush. Today it is a veritable forest primeval.

The camp consists of a spacious mess hall and kitchen, a large recreation hall, the hospital, the director's cabin, a store and long streets of tents. Each boy has a tent all for himself.

The camp is governed by the boys. They have their own mayor and ward leaders. "Co-operative discipline" is a feature of the boys' form of government. The boys can make an all day hike on their own land for the Montclair Council Camp's tract covers approximately 500 acres.

The Cannon Ball Road—so-called because the Tories in yesteryears hauled cannon balls over it from Pompton to Westpoint—passes through the property. Today the ruts worn by the wheels of the Tories' carts are obliterated; the old road is but a trail leading to the lookout from which, on a clear night, the lights of Manhattan Beach can be easily seen.

The camp day at Glen Gray begins promptly at 7:30 o'clock in the morning when the bugle's peremptory notes are sounded. Now that the Western Electric amplifier is available the buglers "boost up the range of their lung power" by using the apparatus to amplify the calls.

The boys turn out at the bugle call, stand at attention while the flag is hauled aloft. Then they go through setting up exercises that start their bodies tingling. After the calisthenics they may take a dip in the lake or retire to their tents until breakfast. Mess over, squads are assigned to various duties.

Frequently "Uncle" plays his piccolo before reveille. This music is also clarified by the public address system and flung far into the forest surrounding the director's rustic cabin.

(Concluded on next page)

(Concluded from preceding page)

At 11:00 the boys may begin to indulge their aquatic propensities and for three-quarters of an hour swim and dive in the crystal clear waters of Lake Vreeland. Mess at noon is followed by recreation periods, including the day's second swimming period at four o'clock.

Sometimes Dave, the colored cook, gives the boys a musical treat. He is a clever manipulator of the stops and keyboard of a portable organ and he possesses a good singing voice as well. His organ recitals and renditions of songs of the sunny Southland are enjoyed by the boys equally as much as are his clever culinary concoctions. Nowadays Dave "does his stuff" with the microphone of the public address system close by. He smilingly says, "Ah knows everybody'll sure enough hear me when ah's got that in front."

At retreat (5:30) the flag is lowered with appropriate ceremonies. At this time new details for the following day are appointed. After evening mess the boys play games or roam about the camp streets until dusk. Then they assemble at the campfire. Here again radio made audible to all the assemblage by the sound amplifier, is used to entertain the boys.

One of the treasured traditions of the camp is that the campfire is kept burning from the hour the first contingent comes to camp until the last departs. A log is pulled out of the final fire before it is extinguished and this charred chunk is kept until it is used the following year to kindle the new fire.

At 9:00 taps is sounded. After taps "Uncle" plays several classical selections on the phonograph. This music, too, is amplified just as radio lectures are during the day. Religious services are held every Sunday night at the campfire. Last Sunday morning the sermon broadcast from St. Thomas' Church, New York City, was amplified.

The scouts at Camp Glen Gray are ever working to

win merit badges in the various subjects for which badges are awarded. Some of the most important sub-



(C. Western Electric Co.)

Dave Simmons, the chef, regales the Boy Scouts at Camp Glen Gray, Oakland, N. J., with organ recitals and song renditions which the boys claim are as good as his culinary concoctions. A Western Electric Public Address System carries Dave's efforts to all parts of the camp.

jects are radio, life saving, first aid, sanitation, forestry, zoology and trailing.

## How to Cure the Squeals

By E. L. Kemp

I WOULD like to tell the "homebuilders" something which may put them wise to handling some of their "weak stations."

I am a "homebuilder," too, and owe my success to RADIO WORLD, to which I am a subscriber. In nearly every issue some one tells us how to tune our sets, but in every such case something is always left to be guessed at or worked out by us. As an instance: We are told that the best point at which to adjust our grid leaks for maximum reception is at the point where the scratchy scream is highest. They state in concluding that this adjustment is now final for the tube used and should be left there.

Ah! They are right, so long as our B battery current remains the same! But—if you use a variable B battery and step it around on different stations, say from 22½

to 45 volts, then I find that O. M. Grid Leak cries out.

You don't have to lose your station when making adjustments if you follow the plan that I have found out works best. Suppose you have a DX station and it is very weak. You step up your B battery and adjust your other controls, but the music or talk is still weak, if it does not fade out in a bunch of squawks.

Try this: See what your antenna condenser reads and then turn it completely to zero. Adjust your grid leak to that high point and then leave it, after you have gotten your signals in loud enough. Then turn your condenser back to its former position and note the increased strength of the signals. All the other controls need not be touched.

I hope that I have helped some of my fellow "homebuilders."

## Mix Radios His Mother from the Arctic

WATERBURY, Conn.—Ten minutes was the record time consumed for the sending of a radio message from Donald B. MacMillan's Arctic-bound schooner "Bowdoin" to Bristol, Conn., via a local amateur station, and the relaying of a reply back to the ship which is northeast of Labrador.

The prophecy that the radio installation on the "Bowdoin" could be utilized by members of the crew to communicate constantly with friends and relatives

at home has proved true and has become a fact.

The message in question was a personal greeting from Donald H. Mix, radio operator with the exploration party, to his mother in Bristol. Communication was established with WNP, the Bowdoin's radio shortly after midnight by Allen C. Lawson here, who immediately called Mrs. Mix by telephone. The reply was soon on its way north and Lawson heard Mix acknowledge its receipt with thanks.

# The Radio Woman

**I**N answer to a frantic appeal for more or less expert assistance, I called on a little friend of mine recently, who earns her living by frolicking now and then for the edification of the T. B. M. on one of the well-known vaudeville circuits. She had a radio set, newly purchased and hooked up, and thereby hangs this tale.

"I bought this thing-um-a-bob yesterday," she snarled sweetly, "because it seemed like a good chance to get my picture in one of these radio magazines, and as my press agent says, 'Publicity is publicity.' But now," she wailed plaintively, "I can't get the dawgone do-hicky to do its stuff. What's the idea of the thing? What do you turn, and how many times do you turn it, and in what direction, and how much, and why? Do you see this funny little knob? Well, I've turned it and twisted it, and swore at it softly, and in loud, vulgar accents, and I've coaxed it with soothing words, and have done everything else but kick it out of the window, which will be my next move, and yet I can't make 'the set do anything more than just squeal and moan and sigh as though it were two cats instead of one. What do you know about these things?" she queried belligerently, as though challenging my advice before it was offered. "The man who put the darned thing here said that it was in perfect condition and he got something or other on it for me, but as soon as he left everything went away from here—including my patience. What's the matter with it? I haven't moved a thing, except this funny little wire, which I thought would look much cuter if it were strung over on this side of the table instead of under it."

Well, talk about hysterics, I never was nearer to them in my whole life. The little dear had very deftly removed the antenna lead from the set and connected it on to one of the B battery leads. No wonder she was getting squeals and howls. I connected it to the right post and under sentence of death forbade her touching any wire until she had read the instruction book thoroughly and understood just what was what. "Why, you might blow up your tubes," I said, "and they would scatter glass in your face and ruin your theatrical career," thinking that a good scare would teach her to use more care.

"Oh, take it away from here. I thought it was perfectly safe. I won't have the blame thing in the house if it is going to behave like a gasoline tank with a lighted match." And then I had to take an hour and explain that there was no danger, but that I simply wanted to throw a scare into her to make her remember

not to fool and fiddle with the little "do-hickies" on the back of the cabinet.

After I got it working nicely and had shown her how to "get the blamed thing to work," she thanked me and told me that anytime that I was down in the "bright light" section of town to run in and she would show me the "ins and outs" of the theatre backstage.

## RADIO PRIMER

**THE ELECTRONIC THEORY**—The electronic theory is frequently quoted in regard to the operation characteristics of vacuum tubes. A discussion of the theory in a semi-popular manner would clear up in the minds of amateurs in the science a very puzzling situation and in a manner make clear what happens on the inside of a tube when the filament is lit.

An electron to begin with is the smallest known particle of negative electricity. According to Webster an electron is defined as follows: One of those particles having about one-thousandth the mass of a hydrogen atom, which is projected from the cathode of a vacuum tube as the cathode rays, and from radioactive substances as the beta rays.

The electron is therefore found to be an electric carrier that has a negative charge. It was discovered by Edison some years ago that a filament enclosed in a vacuum threw off negatively charged particles. These particles were found to emanate in all directions from a heated filament, with terrific velocity, the amount given off being dependent upon the heat of the filament.

Applying the same principle to the vacuum tube, it can be seen that the action occurring within the tube is somewhat as follows: The filament is heated, giving off an innumerable quantity of these negative charges. The plate of the tube naturally has a positive charge and as unlikes attract, the negative electrons bombard the plate.

The grid of the tube, which is placed between the plate and the filament periodically changes from negative to positive polarity, according to the condition existing in the grid circuit at the time. When it is positive, it closes all paths to the plate, much like a gate closes water off when the dam is low, allowing an additional charge to gather behind it, which return to their source. Then as the change takes place, the negative electrons again bombard the plate, being helped by a negative grid, which allows a stream of electrons to cross, carrying from the grid to the plate, which current actuates the phones, they being in the plate or high tension side of the circuit.

*(Concluded from page 6)*

directed to broadcasting, and has been made necessary by the crowding of the hitherto free and unoccupied air, which we call interference. By the allocation of wave lengths, the inspection of transmitting instruments and the attempt to induce better methods both mechanical and personnel, it is trying to minimize troubles so far as possible in the present state of the art.

Avoiding actual control and management, it has left the radio field free to individual research and personal initiative, adopting in this respect a policy unknown to most foreign countries where we frequently find direct management, close control, many restrictions and a strict system of taxes or fees imposed upon all stations and instruments whether for transmitting or receiving. We have chosen rather the minimum of intervention consistent with due regulation, coupled with full assis-

tance in the working out of scientific problems. The government has enjoyed invaluable assistance from the persons directly interested, those who transmit and those who receive, and it appreciates the aid given it through the public conferences held under the auspices of the Secretary of Commerce, and the spirit with which all have joined in trying to solve common difficulties.

Rather than attempt to prophesy tonight, let us welcome this new station, a sturdy youngster, as it needs to be to hold its own with its broadcasting brethren; let us congratulate the men behind it upon the courage, enterprise and genius which have made it possible, and dedicate this latest example of modern magic to the dissemination of knowledge, to the increase of culture, to spiritual development, and to the spread of entertainment and happiness among the countless thousands who will hear its voice.

# A Card File for DX Reports

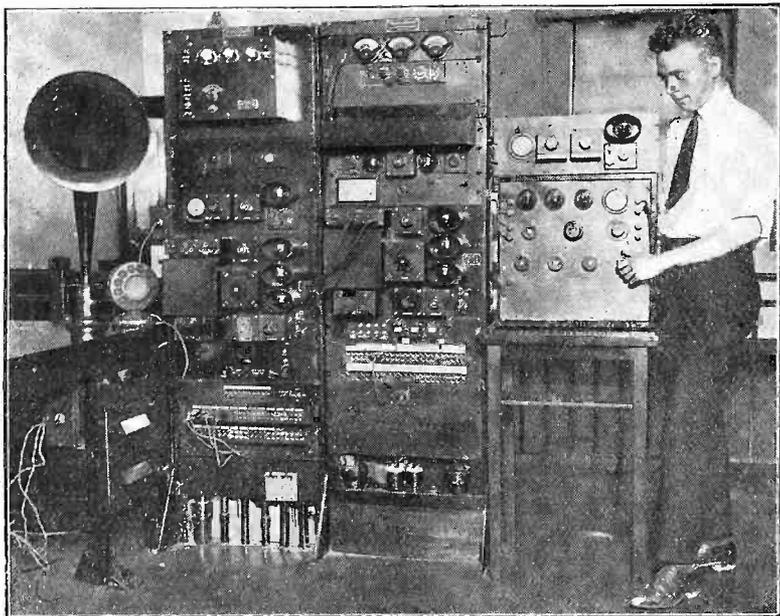
By Charles F. Filstead

**A**MATEURS, as a rule, rate the efficiency of their transmitters by the number and distance of the cards they receive reporting their signals. They are perfectly right: there is no better way of determining the relative "getting-out" qualities of two individual transmitters than by comparing the number of distant stations that they have worked and who have reported them. Some amateurs even go so far as to tack up on the wall all the cards they receive, thus making the interior of their radio-room look very much like a futuristic artist's conception of the setting sun. To get away from this gaudy, patch-work effect, and at the same time have my cards where visitors could see

be best to have them also divided up into districts by index cards. All cards received from outside the United States—including boats at sea—should be grouped under "Foreign." The cards from each district should be placed in front of the index card bearing the number corresponding to that district. To make the finding of a card easy, it is well to arrange all the cards in each district alphabetically. If the amateur still wishes to adorn the wall, he can choose the best looking card from each district he has in Canada and the United States, and also one from each of his foreign countries, and tack them on the wall.

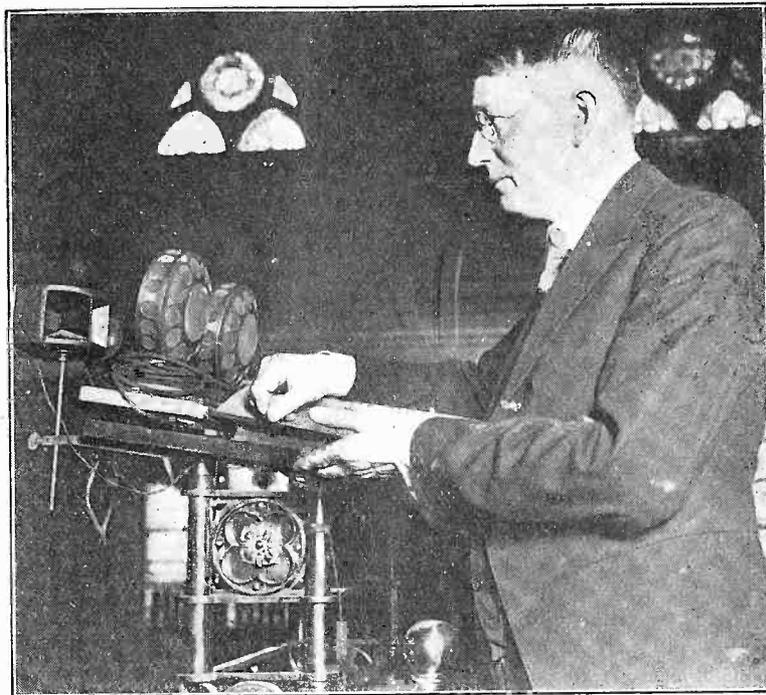
If he so wishes, the broadcast listener may start a

## Harding Memorial Service Broadcast From Station WCAP



(C. Kadel & Herbert)

Speech amplifying equipment of Station WCAP. On the right, Dr. A. Freeman Anderson, who conducted the Harding memorial service at the late President's church in Washington, D. C.



It is estimated that over 1,500,000 radio listeners heard the memorial services held last week in Calvary Baptist Church, Washington, D. C. A close friend of the late President, Dr. A. Freeman Anderson, pastor of the church, delivered the sermon, which was broadcast through Stations WCAP, Washington, D. C., and WEA, New York City. The services were relayed over special land lines from Washington and rebroadcast through the New York City station. Over half the United States was thus enabled to hear the services which otherwise only a few hundred would have been able to hear. Thousands of people journeyed from all over the country to be present at the funeral services of our late President, but those who could not were recompensed in the fact that they were present in spirit and heard the services as well as those who traveled.

them if they so desired, I arranged them alphabetically and according to districts in the form of a regular card catalog. The boxes used to hold the cards in standard card files are too small to hold post cards, so a special box must be constructed. This box may be made of almost any kind of wood, although quarter-inch thick oak or walnut, when properly stained, will probably make the best looking job. The inside dimensions of the box should be three inches high, eight inches long, and five and three-quarter inches wide. A box of this size will hold about 650 standard post cards together with the necessary index cards. The box can be held together with small nails or flat-head wood screws, and when finished, it can be stained and shellaced and, if desired, varnished.

There should be nine index cards, one for each district, and each one marked with a number from one to nine. In addition, there should be an index card marked "Foreign" and one marked "Canadian." If the builder has a great many Canadian reports, it would

"Stations Heard" file, in which he can place a card from each broadcasting station he hears. A good stack of cards from broadcasting stations acknowledging reports of hearing them would be a very good thing to rate the range of a receiving set by.

A large map should be used in conjunction with the card file herein described to show the location of the stations from which cards have been received. A map-tack should be put up for every broadcasting station you hear over a certain distance. The tacks representing the stations you have heard but once can be of one color, and the rest of a different color. These colored map-tacks can be bought at any stationery store. The map should have a cardboard backing heavy enough to hold the tacks and also to prevent them from marring the wall. Amateurs should have one color tack for the stations they have worked and another color tack for the stations that have heard them. To save tacks, it is well to mark stations only over a certain distance.

# Keeping Down the Circuit Losses

By C. White, Consulting Engineer

**T**HERE is nothing more important in building a radio outfit than the amount of losses in the wiring and the parts of the circuit. The best circuit ever devised will amount to nothing if care is not taken to see that excessive losses are avoided. Still if you should look in the back of some home-made sets and see the wiring behind the panel you would readily agree that the losses must be very high. It is a great regret perhaps that the regenerative receiver works when it is poorly constructed, thus allowing the careless constructor to get away without putting together a good job. A reflex circuit is not so gracious and will not function unless built properly, and this has been the reason why so many do not work at first.

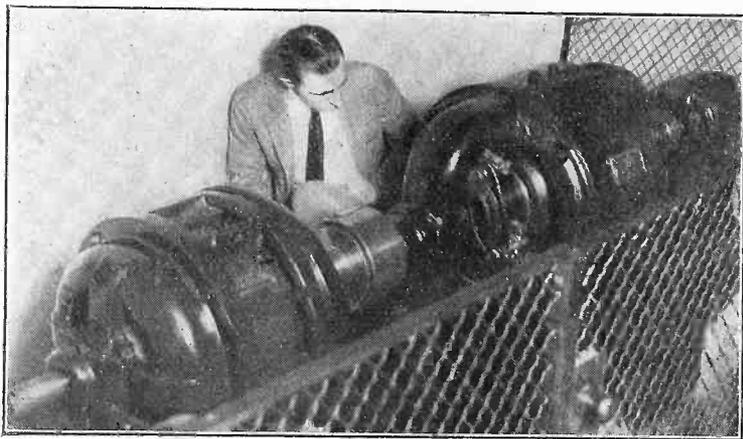
In building your set, first select good standard apparatus that is built right, regardless of the price,

one that is wound with no insulating material, but this is mechanically impossible since the coil must be supported. Certain manufacturers of variometers and variocouplers have made use of this when winding their coils. Recently I made a frame just like the frame of a squirrel cage, or rotary rat cage. This form was made of good insulating material but only enough was used to support the coil. Then I wound No. 22 wire in and out of the rods in a manner resembling a basket weave, and, at the same time I kept the wires well spaced. The fact that the wires were kept well spaced and wound in a basket weave reduced the amount of distributed capacity, which meant sharper tuning and clearer signals; and the fact that as little insulating material as possible was used meant that the signal would be loud since the losses were low. If you are in an experimental frame of mind try the thing out and you will realize the difference it makes.

All connections should be made with bus bar wire, insulated with spaghetti tubing, and well soldered. If you use the type of solder wire that has an acid core take especial care to see that the acid does not spatter on to the panel and other parts of the set. This will cause howling and high losses, since the acid forms a good conducting path. The best way to avoid this is to put the solder on the iron first and then apply to the part to be soldered. A bad method is to place the iron, the solder wire and the part together, which will always result in the spatter of the acid on to other parts of the set. If you use resin flux solder be sure not to get resin all over the apparatus used for a similar reason. Keep all wires as short as possible and yet retain a neat wiring appearance. The latter means a lot when you are endeavoring to trace out trouble or to make some change in the connections. Mistakes are not so liable when everything is kept clean and clear, just the same as in bookkeeping. Blow dirt and dust out of your set when you have finished wiring. A little lump of solder or dirt can cause a lot of trouble.

Shielding is always advisable, but, it can like anything else, be carried to excess. I have seen sets that have entirely too much shielding which detracts from signal strength, since it always causes losses. If you can, do without shielding. This is the reason some manufacturers do as little shielding as possible, just placing a little grounded copper foil in the vicinity of a condenser or variometer. All the rules given in this article seem obvious, but you would be surprised to know that 80 per cent. of the troubles my friends have had because signals did not come through as loud as they should was to be found in one of the rules which they have disregarded in constructing their receiver. The old saying is "Haste makes waste," and it certainly is true with the amateur who tries to build his receiver in a minute.

## Station WJAZ Has 10kw Generator



(C. Underwood & Underwood)

The Zenith Edgewater Beach Station WJAZ at Chicago includes in its plant a 4,000-volt motor-generator illustrated above. It is this station which is expected to pick up messages from Capt. Donald MacMillan's arctic exploration vessel "Bowdoin," now far north of Labrador.

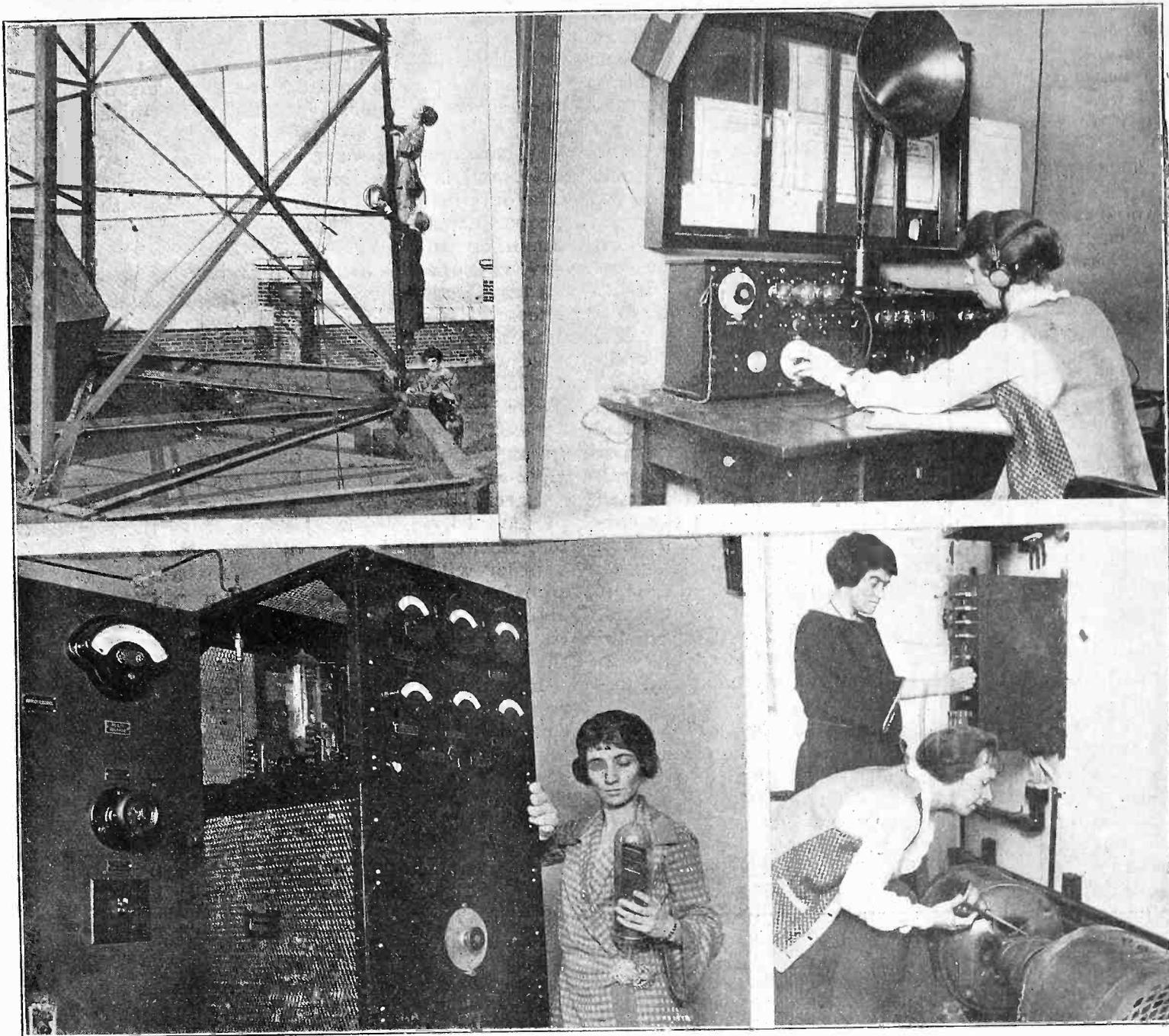
although cheap apparatus is not the same as inexpensive apparatus. The condenser, of course, can not be readily built in the home, hence care will have to be exercised in purchasing one. The plates of a good condenser should be of reasonably heavy gauge metal, evenly spaced, having the movable plates well insulated from the fixed plates. No iron or steel parts should be used in the construction. I always recommend that a condenser be mounted in a metal can, although it is to be used in back of a panel. This means that dirt will be kept out of the plates. You can not imagine just how much dirt can collect between the plates of a condenser, especially with those sets which are mounted on panels and have no cabinet. This dirt forms a rather good by-path for the radio-frequency currents and cuts down the effectiveness of the condenser to such an extent that sharp tuning will be impossible. A laboratory test was made on a condenser when new and another test after the condenser was allowed to sit out in the dust and dirt of the room for several weeks. The difference was most apparent.

The coils in the set are another source of losses. A coil should be wound on good insulating tubing, otherwise high losses are incurred. An ideal coil would be

## Do You Realize It?

**I**T is always a good plan to find out what wire you are crossing or going under when erecting your antenna. It only takes a few hours to make all the inquiries and look around, and you will not be taking a chance of getting killed or injured. Many a man has lost his life or been injured by running wires across high tension or power lines, and having them cross during a high wind or storm.

# Women Operate a Broadcasting Station



(C. Kadel and Herbert)

For the first time in the history of broadcasting women entirely replaced men temporarily in the operation of a station. Station WEAJ, of the American Telephone and Telegraph Company, New York City, was run recently by girls recruited from the regular forces. The upper left hand picture shows Miss Alice Hunt and Miss Elsie Schneeweiss hunting for a leaky insulator up the tall steel mast, while Natalie Connor is checking the wave length from below. Directly next to this picture is Miss Schneeweiss supervising the transmission and keeping a lookout for SOS calls on commercial ship wave lengths. Below is Miss Alice Hunt standing next to the transmitter examining a 250-watt tube. On the lower right is seen Miss Elsie L. Schneeweiss and Miss Natalie Conner oiling the generators and checking up before putting them into service for the day's broadcasting work. Now, who said "A man's a man for a' o' that." It seems that when they get right down to it the so-called weaker sex can give just as good broadcasting service as any man ever did.

## Cures for Distortion of Radio Signals

By R. L. Dougherty

**M**ANY operators of receivers, especially the single circuit type, are troubled with the distortion of signals. This makes itself noticeable in mushy signals and indistinguishable speech and music. In extreme cases it is only noticed in the pronounced overtones or undertones, the middle tones being clear.

There are many causes of distorted signals and a discussion of them and their control will no doubt be of benefit to the average fan not well versed in the extreme technical properties of his receiver.

The most common cause of distortion lies in supply-

ing the filament with too much current. This causes the tube to oscillate violently, causing what is known as "beats." It is noticed when the set is slightly detuned from a station by a pronounced howl. Of course, the remedy for it is to turn down the rheostat until the signals can be heard clear. To test whether you are getting the proper filament voltage, it is only necessary to detune your receiver on either side of the peak, and if quiet but much lessened signals are heard, your filament voltage is correct. In the reception of distant signals an operator will often deem it necessary

(Concluded on next page)

(Concluded from preceding page)

to tune for the station by this "beat" method, but after the station is once located, the filament should be turned down. In single circuits this slight decrease of filament current will oftentimes cause the signals to come in much louder than when the receiver is oscillating violently. With the dry cell tubes it is very hard to control the tube to such action, so a vernier control for the rheostat is advisable, as you will then be able to make the tube work just before it "spills" and starts to oscillate.

Another cause of distorted signals is an improper grid leak. The grid of the tube playing the active part it does in the reception of signals, must have the correct amount of capacity and leak in the circuit. If too little grid leak resistance is introduced, it will carry off an excessive amount of the minute energy, and the signals will be mushy or weak. Sometimes this condition makes itself known by a constant clicking, which will increase as the capacity is reduced, or decrease as the capacity is increased, and will finally disappear and the tube will have a hollow sound. This is the proper capacity for correct operation. If too much grid leak capacity is introduced the signals will be distorted due to the fact that the grid is not obtaining the correct amount of negative electrons through it, and therefore is overcharged and cannot release quick enough for proper operation. When this condition is present, a thick muffled choked signal will be noticed, and the tube will not show a tendency to oscillate freely when the set is tuned. Reduce the capacity to the point where the speech is absolutely clear and undistorted.

Too much capacity in the grid circuit is another cause of distortion. This is noted as a spasmodic clearing of signals whenever the grid circuit is touched with the hand, and a pronounced body capacity effect in the set when tuning. Too little capacity will cause the signals to be extremely sharp toned in quality, the speech resembling a man with an unpleasant voice with a cold, trying to make himself heard in a crowded hall. Tubes are designed for use with certain capacities in the grid circuit, and if the correct capacity does not seem to produce results, a three-plate variable condenser in parallel with the fixed condenser will soon clear it up if too little capacity is noted, and a smaller fixed condenser in the circuit instead of the one used will clear it up if too much capacity is noted.

Excessive B battery voltage is oftentimes a cause of distortion of signals. Radio fans have found out that if the B battery voltage in a circuit is increased, the volume will increase in a like manner. But they do not take into consideration that the smaller tubes can be "overloaded." In the detector tube, especially if it is one of the dry cell type, a certain voltage is specified by the manufacturer. Fans have found out that they cannot damage their tubes if more than the specified amount is placed in the circuit and they accordingly use a greater voltage than the tube can stand. If distortion is noticed and you are using more than the specified amount of current in the plate circuit you can easily determine by shifting the voltage whether this is the cause of the distortion. It sometimes is best to even use less than the specified amount, if clear signals are desired.

Another cause of distortion in radio sets is noticed when too many sets of phones of different types are connected in the circuit. This is because the phones do not all have the same resistance characteristics, and one pair is not functioning properly. If one pair rattles when more than a single set of phones are in the circuit the entire set of phones connected in the circuit will rattle. Test them out separately and discard the set that is causing the disturbance. In the same manner

distortion is oftentimes caused by not having enough resistance in the phone circuit. Frequently a set will bring in much clearer signals when two sets of phones are connected in series than when the two are connected in the circuit in parallel. The test for this, of course, lies in connecting the two sets of phones in the correct manner, by testing out which works the best.

Where amplifiers are used, distortion is very noticeable, and is sometimes almost impossible to correct. The only method of overcoming it lies in the use of the proper transformers, and the use of power tubes as amplifier tubes if possible. These tubes, strange to say, will operate in an amplifying set with wonderful clearness, all other things being equal, and will stand excessive plate current without causing distortion. For instance, the popular five watt tubes can be operated with 190 volts on the plate and sometimes even up to 350 without very noticeable distortion of signals. Were this attempted with the regulation amplifier tubes it is probable that the distortion would be so great that the signals would become a jumble of horrible noises, which would not resemble the voice at all.

Lately there has been quite a bit of trouble experienced by radio fans inasmuch as the signals from one station will be crystal clear, and the signals from another will be mushy and distorted. If you receive signals from the greater number of stations clearly, and a single station is mushy, you do not need to look to your receiver for trouble as it is the modulation of the transmitting station that is at fault.

Probably the most common form of distorted signals results from "forcing" your regenerative sets. This is caused by too close coupling when operating the set just below the "spill over" point. Regeneration can be carried on in a set up to a certain point, and wonderfully loud signals will be the answer, but carry the regeneration or feedback just a little bit too far, and the advantage is lost, for then your receiver becomes a violent producer of oscillations, and you will wake the neighborhood by an overproduction of "birdies" which will cause people to swear and will not get you anything. The obvious thing to do in that case is to reduce your regeneration control to a finer point.

Another method of clearing up distorted signals can be had by the use of a small capacity condenser across the phone terminals. This will oftentimes clear up a signal when all else has failed, provided, of course, that the distortion does not have its origin in one of the other causes.

## Teaching Radio in Sleep Proves Success

FURTHER reports from the Naval Air Station at Pensacola, Fla., on the success attained in teaching radio code to student aviators in their sleep shows progress in this novel and useful experiment. The experimental stage in the trials has been passed and the method has become standard as a means of saving students from failure.

When the test was started 12 students were unsatisfactory in their progress in radio code. After two nights, during which radio code was sent to the students in their sleep, only two of the students were unsatisfactory, and these two men left before the experiment was finished, professing disbelief in it.

The procedure has been to have the students sleep on the tables in the radio room where the code is taught in the regular school periods. Operators send messages at varying speeds all night.

# RADIOGRAMS

WORLD NEWS HAPPENINGS BRIEFLY  
PHRASED FOR OUR BUSY READERS

One firm in the United States turns out 7,500,000 feet of stranded aerial wire a month.

\* \* \*

The First National Bank of Whitehouse, N. J., as an experiment installed a radio receiving set with a loud speaker in its women's banking department. On "radio days" the First National's receiving teller is now kept busy opening new accounts.

\* \* \*

A small radio receiving set has been installed at every bedside in Beth Israel Hospital, New York City. The superintendent hopes the device will lighten the patients' sufferings by turning their minds from their own discomfort and loneliness to concerts, lectures and news reports.

\* \* \*

The one medium in existence today which has the greatest possibilities for creating a love and an appreciation of beautiful music in the American home, is the broadcasting station. It is safe to say that every earnest program director of radio broadcasting in the world is endeavoring to provide for the public a menu of the best musical food.—Fred Smith, Studio Director Station WLW.

\* \* \*

Thomas A. Edison and Mrs. Edison left West Orange, N. J., last week for a month's automobile trip through the Middle West with Mr. and Mrs. Henry Firestone, of Akron, O., and Mr. and Mrs. Henry Ford. The party will travel through the Northern Michigan Peninsula and the Eagle River district of Wisconsin. At some place in Michigan or Wisconsin they will camp two weeks. Mr. Edison expects to return about September 1.

\* \* \*

Silver champagne buckets were put to a use which is a commentary on the times at a "good will luncheon" given by the United States Lines aboard the "Leviathan" in her dock at Southampton, England. These receptacles, once a necessary part of a ship's dining service, were inverted on the tables and on them were placed the loud speakers of a voice amplifying system installed to make the speeches audible to everyone of the 500 guests present.

\* \* \*

The U. S. S. "Pittsburgh" operating in the Mediterranean Sea states in an official report that the Radio Station at Poitiers, France, was communicated with on 3,350 meters CW using a 20 KW arc with 45 to 50 amperes radiation. The greatest distance traversed by the radio dispatches was approximately 1,800 miles, while the "Pittsburgh" was at Alexandria, Egypt. Poitiers reported that all signals were good in the evening, being heard through heavy static interference.

\* \* \*

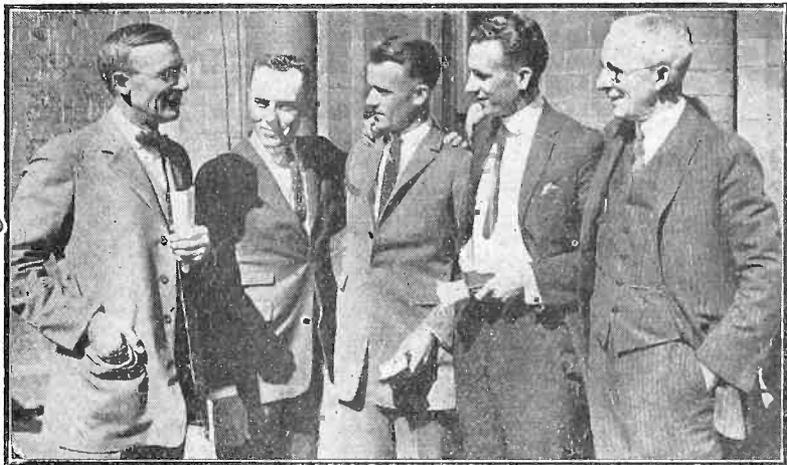
The Supervisor of Radio for Atlanta, Ga.—Walter Van Nostrand, Jr.—will open his office in the Federal Building soon, it was announced at the Department of Commerce last week.

Orders directing him to proceed from his old station at Norfolk have been issued, and he was expected to leave for Atlanta immediately.

\* \* \*

Major Edw. H. Armstrong, to whom was granted Patent No. 1,113,149 for the regenerative circuit, one of the most valuable in the radio industry, had a tough time to get started. After he had made his invention he asked his father and his uncle for money to secure a patent and both refused. However, he had his drawings witnessed before a notary and thereby recorded his discovery. He filed an application for a patent on October 29, 1913, which was granted on October 6, 1914. In spite of numerous attacks the courts have sustained and protected Major Armstrong's patent in every instance. The invention was made while he was a student at Columbia University, New York City.

## Los Angeles Mayor Awards Radio Medals



(C. Keystone View Co.)

The first radio operators to receive decorations for meritorious service in time of extreme peril were the three on the S. S. "City of Honolulu," which burned and sank in mid-Pacific. The Radio Corporation of America donated the medals which were presented to the operators by Mayor George C. Cryer, of Los Angeles, Cal. The picture shows the mayor at the extreme left congratulating them. Left to right they are Mayor Cryer, N. C. Kuller, third operator; Walter P. Bell, chief operator, and H. D. Hancock, second operator.

The Mayor's secretary on the extreme right.

## The "Wouff-Hongs" Will Be at the Chicago Convention

CHICAGO, ILL.—Initiation of candidates into the Royal Order of the "Wouff-Hong" will be one of the principal features on the last evening "night of mystery" at the Second National American Radio Relay League Convention which is to be held here September 12-15 under the auspices of the Chicago Radio Traffic Association. Convention headquarters will be the Edgewater Beach Hotel.

The order of the mysterious "Wouff-Hong" has become an institution in amateur radio and its membership is spreading rapidly over the entire country wherever there are radio men. The word is believed to have originated with the "Old Man," for years a contributor to the amateur magazine "QST," but whose real identity and general status in amateur radio has never been revealed.

One story has it that the "Wouff-Hong" is an instrument used to eliminate interference by annihilation of those who are over zealous in their use of the ether.

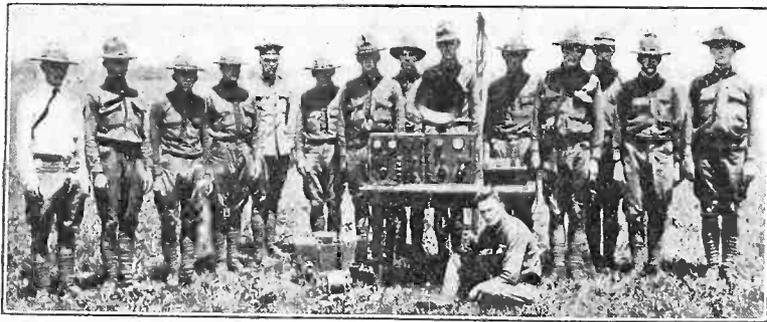
What is reputed to be an exact replica of this "deadly" weapon, somewhat resembling in its construction an Indian tomahawk, actually exists.

As a secret order the "Wouff-Hong" had its beginning at an amateur convention in Flint, Michigan, at which time several hundred candidates were initiated. Interest developed to such an extent that another meeting was staged at an Ohio convention.

Through the traffic system of the American Radio Relay League the fame of the order has been spread far and wide, with the result that a constitution and ritual may be adopted formally in Chicago and the "Wouff-Hong" will hold henceforth a unique place in amateur radio affairs.

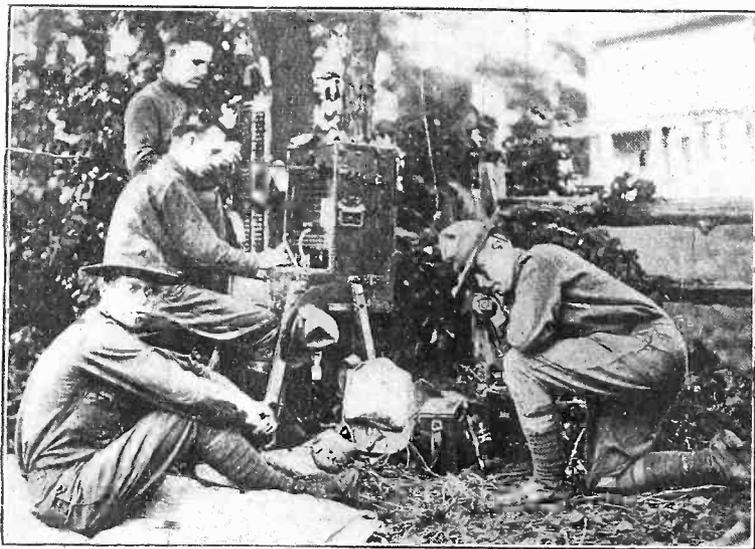
Latest developments in amateur and broadcast reception and transmission will be covered by speakers of national reputation, according to R. H. G. Mathews, central division manager of the league, and committee-men in charge of the convention program.

# A Round Dozen Sparkling an



(C. Underwood and Underwood)

Reserve officers of the Signal School, Camp Alfred Vail, New Jersey, who are learning to become radio operators, listening to a Sunday afternoon concert while off duty. All these men are given a thorough course in the operation, maintenance and theory of radio. Because of their training the United States Army has the best radio and telegraph operators.



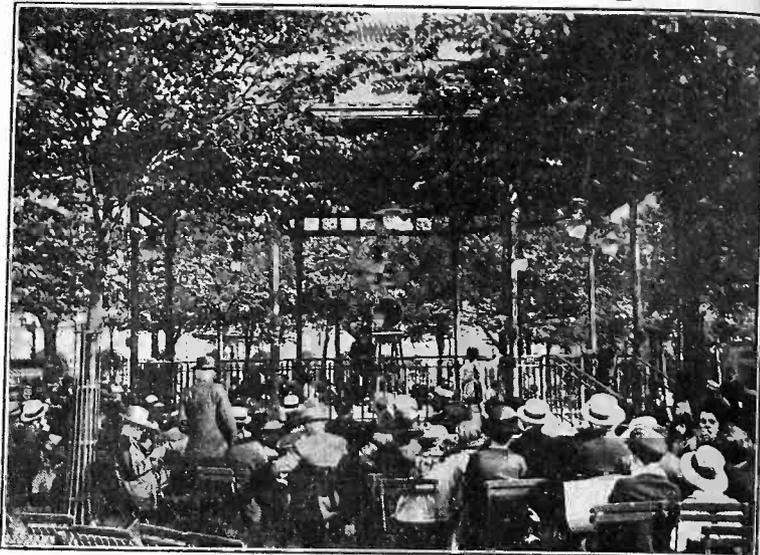
(C. Underwood and Underwood)

Another interesting branch of communication work taken up by the Signal Reserve Officers Training Corps School, at Camp Vail, is the field telephone. Here the men learn all the ins and outs of installing and operating a regulation army field telephone set. The conditions these men work under during practice and war-time are strenuous and severe.



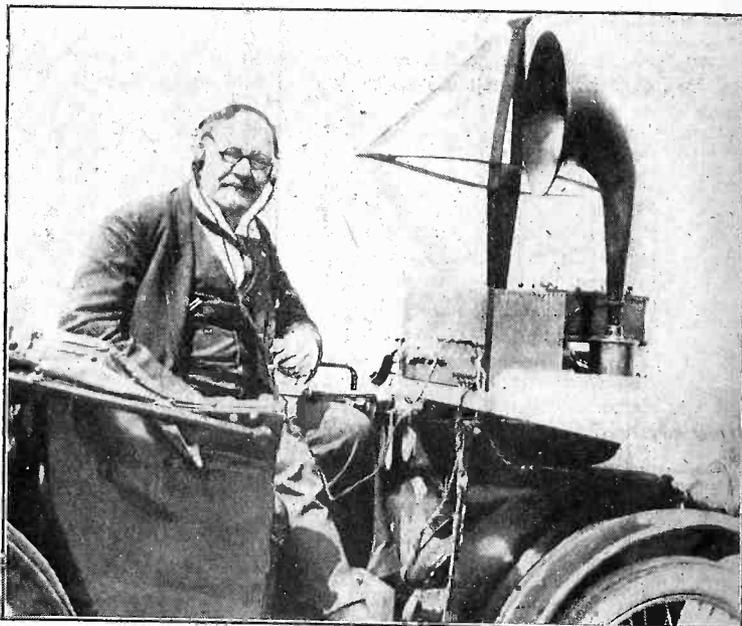
(C. Kadel and Herbert)

Miss Pearl Eaton and Miss Lois Wilde are the proud possessors of a full-fledged radio set, and being kind-hearted, like to let the neighbors in on what's what. So they set the loud speaker out the window, and give everybody a chance to hear the concerts.



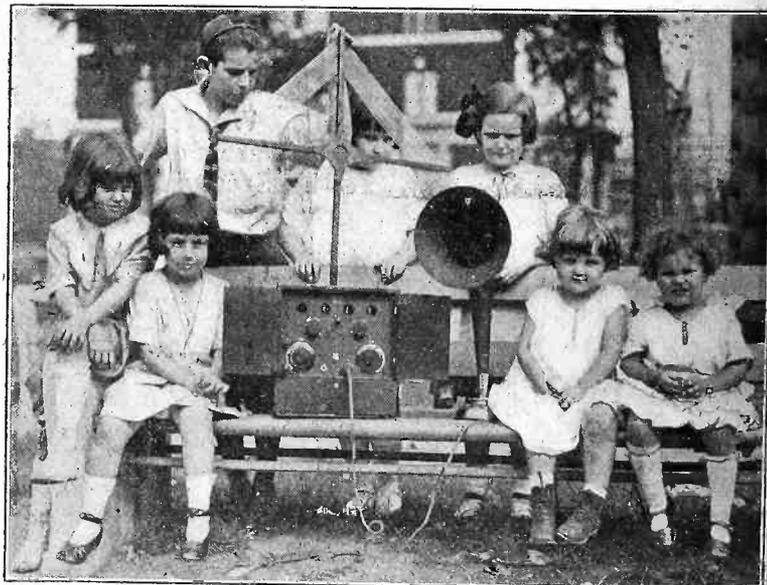
(C. Kadel and Herbert)

Broadcasting de luxe. Here is the manner in which they broadcast popular concerts in Paris, France. The old bandstand on the Champs Elysees no longer holds the proud bandmaster and his band of trusty musicians. Instead it has been replaced by the efficient loud speaker and radio set.



(C. International Newsreel)

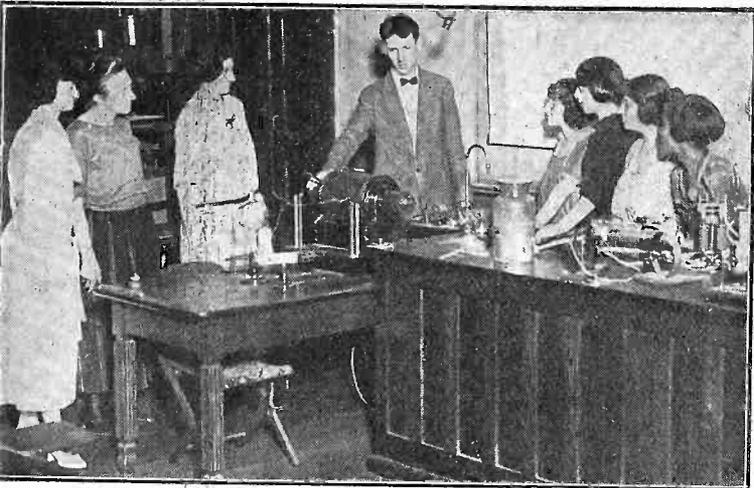
Colonel E. H. R. Green, the well-known millionaire radio fan and experimenter, touring the country near his home in his new electric runabout which is equipped with a seven-tube receiver. He oftentimes goes on short trips of this sort to determine just how his broadcasting station, located on his vast estate near South Dartmouth, Mass., is working.



(C. Kadel and Herbert)

Here is one young man who realizes that every one hasn't the good fortune to own a radio set. Master Edmund Keene, who is the proud possessor of a De Forest reflex, thinks that other people can also get some fun out of it, so he takes it to Central Park, New York City, and lets the mothers and their kiddies enjoy a concert every afternoon.

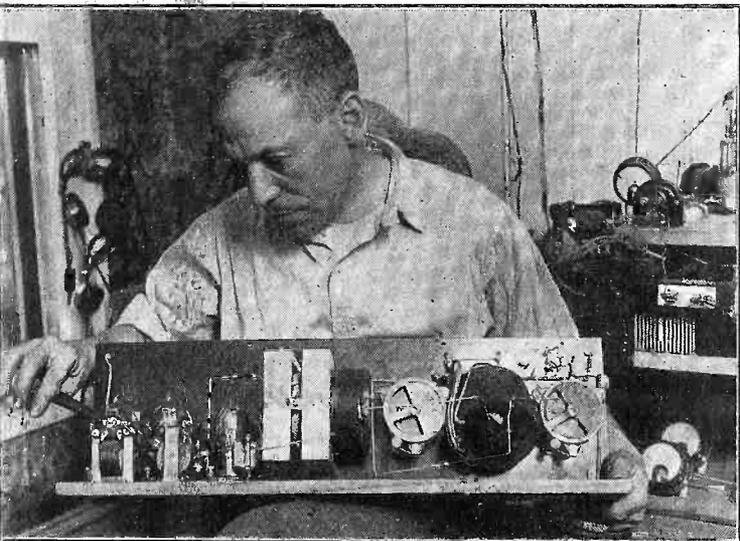
# Interesting Radio Pictures



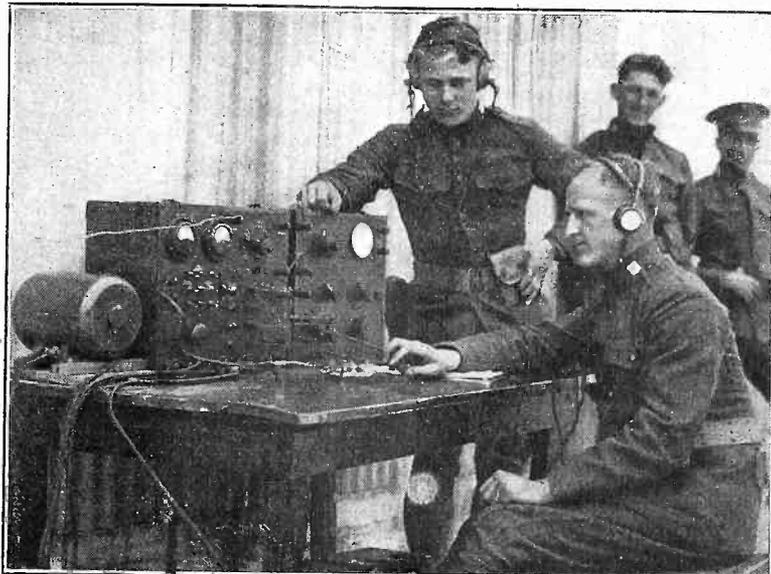
(C. Acme Service)  
 Class in radio at Hunter College, New York City, mastering the principles of induction. Dr. A. Turner explaining the action of an immense spark coil, operating from a six-volt storage battery, to a class of women students who are taking a course in radio. Radio is fast becoming a popular course at all colleges, both for men and women, and the interest taken is largely attributed to the popularity of broadcasting and the innate curiosity of human beings to know "what makes the wheels go round." Many women have applied for courses which when completed will entitle them to sign their names as R. E., or radio engineers.



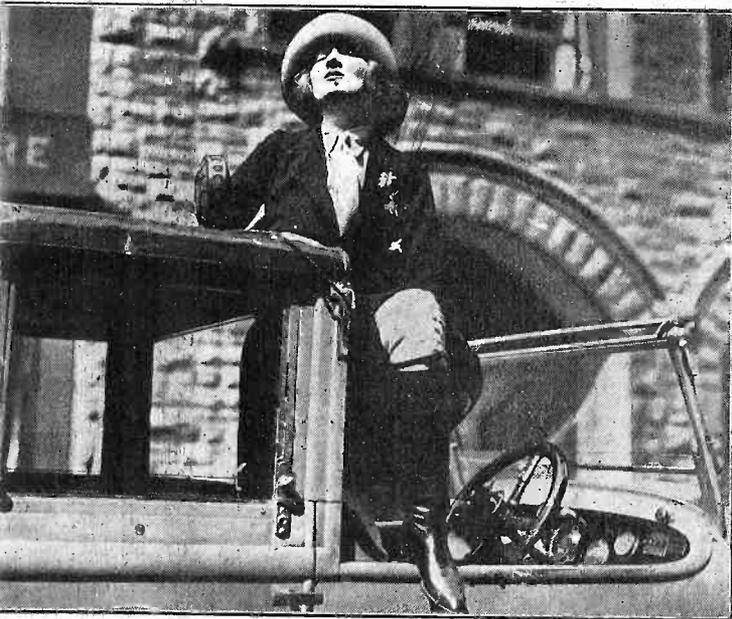
(C. International Newsreel)  
 Caesar and Buddy, two canine radio hounds, listening to a vocal solo. Evidently Caesar does not appreciate the ladies' efforts to please, by the cynical expression on his face, while Buddy is laughing right out loud. Well, we can't please everybody.



(C. Kadel and Herbert)  
 Johnson, better known as Radio 2CTQ, finishing up his newest three-circuit receiver, which he especially designed to be super-selective. Of special note to builders is the fact that the constructor has left plenty of space for every instrument, crowding nothing. This, and the use of the best instruments, is the only method by which receivers can be constructed for selectivity. Note also that five-watt tubes are used as amplifiers.



(C. Kadel and Herbert)  
 Radio plays an important part in the destruction of airplanes these days. During a recent anti-aircraft practice shoot at Fort Tilden, New York, the boats were constantly informed of the activities of the scout planes, and nearly 100% hits were recorded as a result. The illustration shows two scout officers signaling the boats as to the position of two of the "enemy" planes.



(C. Kadel and Herbert)  
 During the recent warm spell Peggy Joyce had a date to broadcast a speech. As the studio proved entirely too uncomfortable to talk in (it is, closed in as it is by heavy draperies to prevent noises) she suggested that they run the wires for the microphone out to her Rolls Royce, where she gave her talk in comfort.



(C. Underwood and Underwood)  
 Two lucky scouts at Camp Kanohwahke, Interstate Park, N. J., listening in. It will be of interest to radio fans to know that at the present time there is not a single scout outfit in the United States that does not possess at least a radio receiver, while many of them even boast licensed transmitting stations, which the scouts operate.

# A "Neutro-Generative" Receiver

By C. White, Consulting Engineer

**R**ADIO-FREQUENCY amplification and regenerative receivers have had one common fault—the tendency to oscillate. With the latter it has been possible to exert very good control over this tendency by the proper construction of the working parts and the correct amount of control. In fact, some regenerative receivers have such a fine degree of control that it is easily possible to tune in distant stations without allowing the tube to oscillate in order to get the carrier wave whistle by the zero beat note method. The very function of regeneration is holding the detector tube on the verge of oscillation, but not allowing it to "spill over." But radio-frequency amplification is amplifying the radio-frequency carrier wave before detection, and does not in any way depend upon holding the tube or tubes on the verge of oscillation as in the case of regeneration. Yet it is often true that

respective negative sides of the "A" battery. Still, I think that the presence of these controls affords a control of volume as well as quality and are well worth their trouble and expense. The inductance coil L is wound on 4" tubing, having 60 turns in all of No. 22 S. C. C. magnet wire tapped at every tenth turn for a switch point. The coil F is constructed in the same identical manner, while the coil E is wound on 3½" tubing with 60 turns of No. 22 S. C. C. untapped. The coil E is placed inside of the coil F, and the overall length of the unit L and the unit E-F will not exceed 3½" apiece. The condensers are as follows: C-1 23 plates with vernier attachment; C-2, a very small two plate vernier condenser; C-3, a .5 mfd. condenser; C-4, the same as C-3; C-5, an 11 or 13 plate condenser with vernier attachment; and C-6, a .002 mfd. phone by-pass condenser. The manner in which these condensers are actually connected in the circuit will certainly make a lot of difference, so I advise a close following of these instructions. The condenser C-1 has the movable plates connected to the Ant., C-2 has the fixed plates connected to the grid of tube No. 1 and the movable to the switch-arm on coil F, while C-5 has the fixed plates nearest the grid of tube No. 2.

It is of the utmost importance to carefully shield this set with copper foil so as to prevent howling and annoying body capacity. The choke coils X have an inductance of .1 henry and are iron core chokes. This set is designed to operate with the new UV199, hence two separate "A" batteries are recommended. These batteries can be of the flashlight size since these tubes draw very little current, above .06 ampere. The grid leak H to be used with the UV199 or C299 should be variable from two to five megohms and a grid condenser of .00025 mfd. is advised. The filament rheostats should have a resistance of about 30 ohms apiece. The potentiometers P-1 and P-2 should have a resistance of 400 ohms apiece and be non-inductive. Any good variometer will do as a plate inductance on tube No. 2.

This receiver operates best with a very short aerial and is far more selective and clearer than when a long outdoor aerial is used. Tuning a station is in control of the inductance taps on L, the condenser C-1, and the condenser C-5. The variometer controls the volume to a certain extent. The taps on the coil F and the condenser C-2 should be adjusted so as to prevent oscillation at all wave length ranges of the receiver. If this is not possible with your particular receiver then the wave length bands will have to be grouped and a setting for each group will correspond to a definite calibration on C-2 and F. After C-2 and the taps of F have been ascertained there is no more guess work or further adjustment necessary. The set is very flexible and it will be soon discovered that several good adjustments can be made for each station, but there is always one that gives the best results. When properly built the receiver is very efficient, but care must be exercised to see that it is properly constructed. Grid leads must be kept as short as possible, and all wires should be well insulated with spaghetti. Audio-frequency amplification can be used with this receiver. It will be found advisable to use separate "A" and "B" batteries for the amplifier, however, in order to keep the outfit quiet working. Since UV199 tubes are used the extra expense is not very heavy and the results produced certainly warrant it.

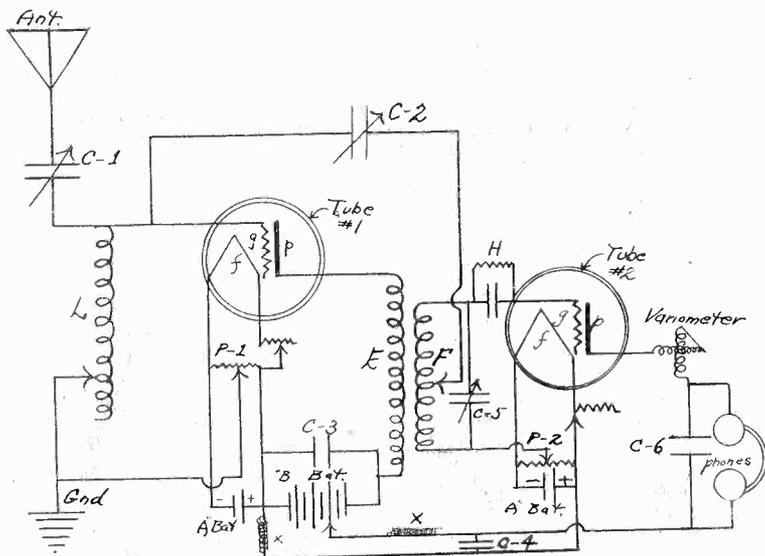


Diagram of a two-tube receiver that embodies several excellent features. It is a radio-frequency amplifier, which is regenerative, and at the same time will not oscillate violently beyond the "spill over" point due to the neutrodyne principle that is employed. It is simple to construct, requiring the construction and winding of but three coils, two of which are tapped. Audio-frequency amplification can be added, but, as shown in the diagram, separate batteries should be used for that purpose. Sufficiently loud signals will be possible with this receiver if headphones are wanted, and the clearness and quietness of operation will satisfy the most critical.

when a tube is on the best part of its radio-frequency amplifying characteristic it is very apt to "spill over" and spoil the amplification. To prevent this spilling over or oscillating various methods or dodges have been resorted to. One common method is the insertion of a resistance by means of a potentiometer in the filament-grid circuit of the amplifier tube which produces no serious harm when the tube is amplifying but introduces high losses if the tube tends to spill over or oscillate. It acts as a check on the tube action. But lately another method of prevention has been used, namely, the "neutrodyne" method, wherein the capacity of the tube element is balanced or neutralized by a condenser of very small capacity.

I shall not endeavor to go into the discussion of the merits of various methods, but only to say that the receiver here outlined combines in some respects the essential parts of each of the three systems. Of course, if it is desired to economize and cut down the number of controls the two potentiometers P-1 and P-2, in the diagram herewith, can be omitted and the grid returns of the tubes No. 1 and No. 2 can be connected to their

# Latest Radio Patents

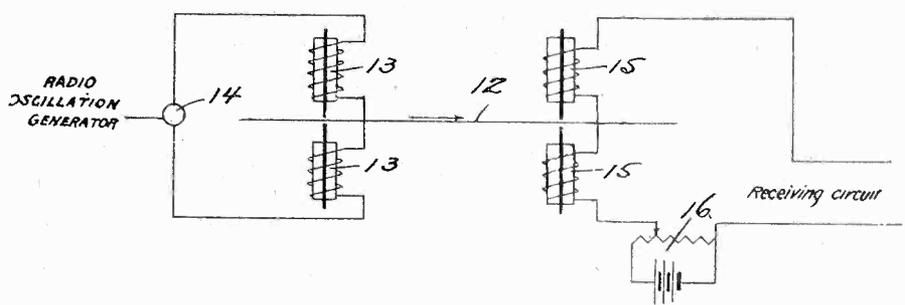
## Method of Sensitizing the Telegraphone

No. 1,459,202: Patented June 19, 1923. Patentee: L. F. Fuller, Palo Alto, Cal.

The telegraphone, as is well known, comprises an instrument in which a magnetizable wire or surface is locally magnetized in varying degrees at successive points along the wire or surface and at this spot magnetization persists, so that a record is produced on the wire or surface which may be subsequently reproduced. An object of this invention is to sensitize the telegraphone so that it will record magnetically on its wire very

the drawings accompanying and forming part of the present specification. In said drawings I have shown two forms of apparatus for carrying out the method of my invention, but it is to be understood that I do not limit myself to such forms, since the method may be performed with other forms of apparatus.

An object of the invention is to sensitize the telegraphone so that it may be used for high speed radio signal recording, submarine cable signal recording, long distance telephone message record-



Method used to sensitize the movable recording wire of a telegraphone making it sensitive to much weaker impulses than is now possible. It is applicable to radio recording devices.

much weaker electrical impulses transmitted to its magnetizing coils than is at present possible.

The invention possesses other advantageous features, some of which with the foregoing, will be set forth at length in the following description, where I shall outline in full that form of the invention which I have selected for illustration in

ing and the recording of other weak electrical impulses.

Attempts have been made in the past to use the telegraphone for high speed receiving, but these attempts have been mostly unsuccessful, due to the insensitiveness of the telegraphone, which required abnormally strong signals to cause a record on the telegraphone wire.

## Receiving System

No. 1,462,882: Patented July 24, 1923. Patentee: Henri Chereix, Paris, France.

The present invention relates to improvements in relays of the kind described in my copending applications Serial Nos. 496,667 and 496,668, filed August 29, 1921, and more particularly to an improved adaptation of the said relay for automatic calling arrangements in wireless telegraphy or telephony.

Generally speaking, the improvement effected by the present invention consists

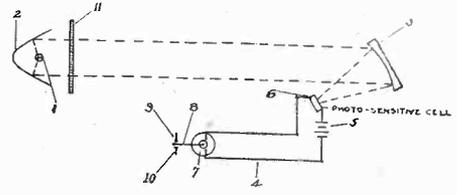
brator system is preferably arranged in a special manner by the combination of the two electro-magnetic relays.

\* \* \*

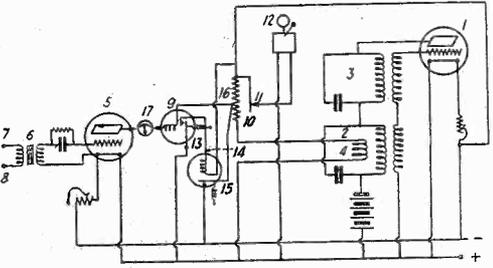
## System of Electrical Control

No. 1,458,165: Patented June 12, 1923. Patentee: W. W. Coblenz, Washington, D. C.

This invention has reference to improvements in a system of electrical control, having for its object to provide a novel apparatus and method of thermal radio dynamic control of mechanisms whereby to render possible the remote control of various mechanisms possible and practical through the use of light re-



Improved method of controlling electrical circuits by means of beams of colored light projected to affect photo-sensitive cells, which in turn actuate sensitive magnetic relays.



Means of providing an electrical call system that may be actuated by means of radio. Electronic relays are used in connection with tuned circuits specially designed to operate magnetic relays upon reception of certain waves.

in the following: a vibrator system and a thermostat associated therewith for actuating a call indicating apparatus such as a bell is carried back to the circuit of the element that controls the oscillating conditions (comprising a three electrode tube arranged as a detector in accordance with the previous applications). The vi-

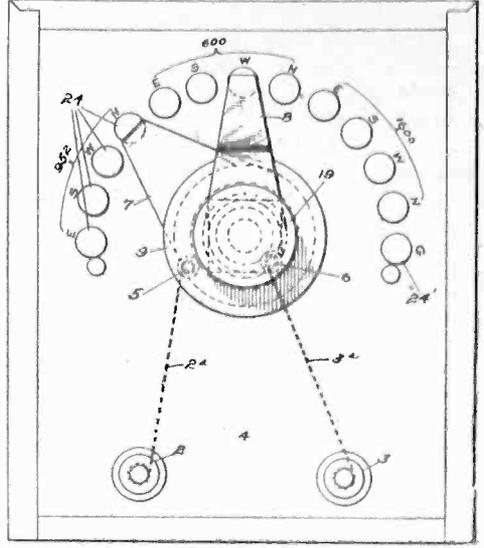
active material interposed in the control circuit and adapted, with the projection of certain colors of light rays from a point distant thereonto, to have its electrical conductivity either increased or decreased whereby to vary the passage of current through the circuit and to bring about the desired operation.

## Antenna Selector Switch

No. 1,458,466: Patented June 12, 1923. Patentee: Alfred Crossley, Washington, D. C.

My invention relates broadly to underground radio receiving systems and more particularly to a switching device for use as a selector to connect various combinations of antennae to the radio receiving apparatus for directive reception.

The object of my invention is to provide a practical selector switch capable



Apparatus and means for rapidly switching receiving apparatus from one antenna system to another. This method is especially applicable to underground antenna systems, which possess marked directional effects, thereby giving a great degree of selectivity.

of rapid manipulation to connect various combinations of underground, elevated or loop antennae to the receiving apparatus.

Another object of the invention is to provide in an antenna switch construction means for insuring perfect electrical contact of the switch elements.

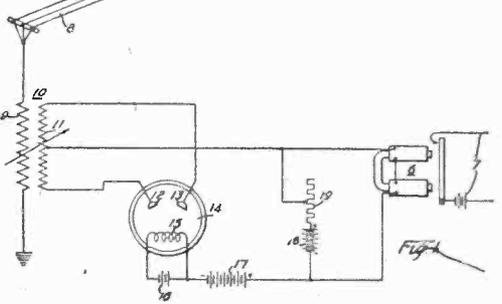
My invention will be understood by reference to the accompanying drawings which form a part of this specification and in which like reference characters have been used to indicate like parts throughout the several views.

\* \* \*

## Receiver for Wireless Impulses

No. 1,456,367: Patented May 29, 1923. Patentee: Frank Conrad, Pittsburgh, Pa.

This invention relates to apparatus for the receipt of wireless impulses and it has for its object to provide apparatus of the character designated that shall enable one to distantly control relays or other forms of electrical apparatus by



Means of actuating a relay by ether vibrations. The apparatus can be used to control machinery at a distance and to control any electrical circuit from the same point.

means of wireless impulses and, at the same time, to substantially prevent the operation of such apparatus by other than the impulses intended therefor. The accompanying drawing is a diagrammatic view of a system embodying the invention, being shown for the wireless control of a distant relay.

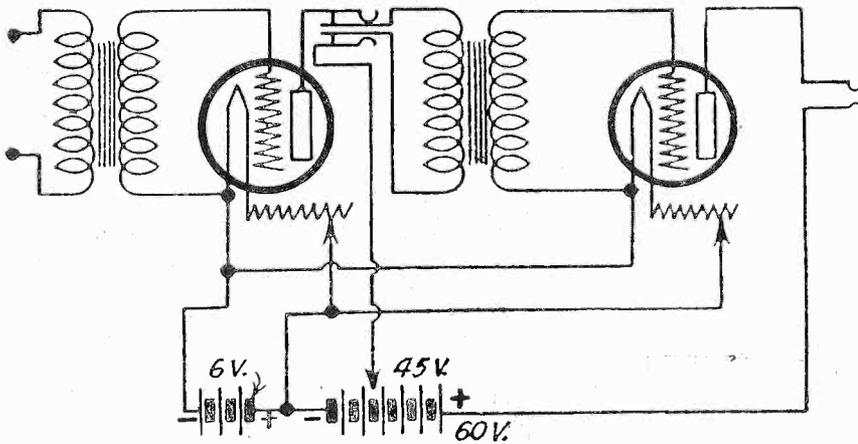
# Answers to Readers of Radio World

In RADIO WORLD, July 7, you published a Lighthouse Receiver. What size wire is used on the coils, and what size are the former? Also what size variable condenser is used?—W. K. McClain, Lawrence, Kans.

For the coils mentioned No. 26 SCC wire is sufficient. The former should be cut out of fibre or heavy cardboard, and should be four inches outside diameter with a core one inch across. The number of turns is shown in the diagram. A .0005 variable condenser is sufficient.

Enclosed find a circuit published in RADIO WORLD, June 23, by A. D. Turnbull. Kindly give me a correct hook-up to use with it. Where should I tap the variometer? Which is the positive side of the B battery? Kindly give me a two-stage amplifying circuit for use with this circuit.—Y. T. Harvey, New York City.

Your question is vague. The hook-up as you show it and as it is in the magazine are identical, and both are correct. If you mean a panel layout for such a



Schematic diagram of a suitable two-stage amplifier asked for by Y. T. Harvey, New York. The circuit is shown using separate A and B batteries from the detector circuit. This prevents any chance of feedback through the battery leads from the detector.

set, we do not handle them, as we leave the design of the set up to the builder. The variometer is tapped at the connection of the stator and rotor, which is generally made by means of the shafting that runs through the rotor. The amplifying circuit you mention is printed here-with.

Is the Grimes inverse duplex circuit superior to the De Forest reflex as used in the D7 receiver? I intend using Acme A2 transformers, and Acme radio-frequency transformers. Which type do you recommend as being the best? Could I use an outside antenna and variocoupler as tuner instead of the loop as described?—Teddy Kuss, Pine City, Minn.

We cannot discuss the relative capabilities of the various circuits in comparison with manufactured apparatus. However, you will not make any mistake in constructing the circuit you mention if great care is taken. In reflex circuits the greatest care must be observed in wiring, as well as in the selection of the parts.

You can use the type of radio-frequency transformers you mention. The numbers they go by signify the wave length that they are supposed to tune to. Therefore determine beforehand just what wave length you wish to receive over and buy your transformers accordingly.

You can use a coupler and antenna and ground by simply connecting them across the terminals of the condenser that shunt the loop. Numerous articles have appeared

in RADIO WORLD showing tuning units that can easily be constructed for this purpose.

I have built a two tube reflex, with crystal detector, according to diagram enclosed. My trouble lies in getting any distant stations, and also in keeping them after I once get them. They just seem to fade out, and I cannot get them any more. The entire set oscillates very easily; as a matter of fact, I cannot stop it from oscillating. My apparatus is all the best make and has worked in a one tube reflex successfully.—Wayne H. Merrick, Caldwell, Idaho.

Your diagram for a two tube reflex set is absolutely correct, and is the ordinary two tube reflex circuit using crystal detector. The fact that your set is oscillating is due to inter-coupling between the transformers. Separate them by a sufficient distance and if possible have their cores at right angles to one another. Shielding your panel carefully might help the fading of stations after you have them tuned in. Do not run your leads parallel to one another

for too great a distance and use varnished cambric tubing to insulate them.

Do W. D. 12 tubes require a different hook-up than that used by the regular six volt tubes? I am using three of these tubes as radio-frequency amplifiers but cannot seem to get the third stage to work successfully.—John Gallub, Box 65, Chatham, N. Y.

These tubes do not require a special circuit. Examine the transformer of your third stage. Your trouble may lie in the fact that you have a defective transformer, which is the only thing that would cause your trouble if your set is correctly wired.

I have constructed the Cockaday circuit described by R. P. May in RADIO WORLD. It works fine, but I am puzzled as to the need of the switch S in the drawing. I have left it at the place shown in the drawing but it does not seem to be necessary. When should I use it?—F. W. Kerchner, Glen Corbon, Ill.

In the tuning in of distant stations it is sometimes necessary to use this switch. It has a neutralizing effect on the third tube and allows finer tuning by allowing a bias to be placed on the grid, or to allow a certain capacity feedback on the third tube, which will help in certain cases. You must experiment in each case and find out just which works best.

I am enclosing a circuit diagram using one stage of radio-frequency, detector and

two stages of audio-frequency. Do you think that a transformer would work better than the tuned impedance coil that I am now using?—John Hauge, R. 1, Box 21, Ulen, Minn.

The circuit diagram you enclose has one error. The condenser and grid leak should be placed in the grid leak of the second tube instead of the first. As it is you are using it as a detector instead of an amplifier.

If you make this change the circuit should work satisfactorily. This type of radio-frequency is more efficient than transformer coupled, inasmuch as you can tune your R. F. tubes and get better tuning. By all means keep the present set, and just change the grid leak as directed.

In RADIO WORLD, July 21, was described a midget set by Dick Roberts. Will you kindly furnish a diagram of the set as described? Will you kindly furnish all the constructional details, such as the winding of the coil and the apparatus and size of wire used in the set. What kind of a tube is used?—Newton Dringel, 14 Johnston St., Wilkesburg, Pa. S. K. Fountain, Rocky Mt. N. C. Frank Kontout, P. O. Box 270, Oakville, Conn. L. J. Snyder, Pierson, Iowa. Harry J. Hubbard, 64 Katherine St. New Bedford, Mass. J. Schwartz, 3409 Benitan Ave., Detroit, Mich. G. H. Richardson, 310 Filmore Ave., Plainfield, N. J. Walter C. Sperber, 146 West 62nd St., New York City. Mathew Jordan, 33 Coenties Slip, New York City. Anthony Suir, Shoreham, N. Y. John A. Dengler, Jr., 218½ N. Minn St., New Ulm, Minn. Dr. Hugo S. Thomson, 535½ Main St., Springfield, Mass.

The diagram as well as the constructional details of the circuit are published in this issue of RADIO WORLD. The address of Dick Roberts is Box 573, Miami, Oklahoma.

In the upper right hand corner of page 17 of RADIO WORLD, July 14, you show a new loud speaker, which I have heard was invented in France and is said to be a wonder. Can you give me some information as to where it can be obtained?—Arthur Hammikson, Prince Bros. Service, Sayre, Okla.

We do not see any mention of the new loud speaker. The picture in question shows a Marconi wagon being used to initiate the rural towns of England to radio. The speaker used looks to us like a regular loud speaker with a straight horn instead of a curved one.

I recently bought a W. D. 12 tube which was supposed to be new. After a week's use it ceased to light. Is there any way of determining whether it was a rebuilt tube that was sold to me for a new tube? Can I buy these tubes directly from the manufacturer?—Alf Hjemo, 11 Stephens Place, Port Richmond, N. Y.

There is no way in which you can determine whether a tube has been re-built if it is done cleverly. If the tube was sold in a sealed box, the manufacturer guarantees it, but not after use. You can buy these tubes from the manufacturer.

I have constructed the W. D. 11 circuit described by Ortherus Gordon in RADIO WORLD for Jan. 20. Three people have looked over it and cannot get it to function. I cannot get a single sound out of it. Kindly tell me what is the trouble.—C. M. Adams, Alpine, Washington.

Reverse your B battery leads so that the plus will go to the phones and plate and see if that does not help you out.

Will you kindly give me the following information: The constructional details of the "moving coil" element of the Magnavox. Also the details of the step down transformer that is used.—Harry A. Higginbotham, Orland, California.

As this is a patented device, the details must be secured from the manufacturer.

\* \* \*

I have built the set described by Arthur S. Gordon in RADIO WORLD, April 14. I now wish to add either one stage of radio-frequency amplification, or an additional stage of audio-frequency amplification, whichever you think will be best to increase my distance. What kind of tube should I use? What type of transformer? I am using a UV-200 for detector and a Cunningham for the audio-frequency amplification. What tube should I use for the circuit you mention? Will I need any additional batteries? Will the additional tube you mention enable me to operate a loud-speaker?—Charles G. Rose, P. O. Lorain, Ohio.

The circuit you desire is published herewith with the addition of one stage of radio-frequency amplification, which is the best method of increasing the distance of a receiver. Audio-frequency will not increase distance, as it will only amplify signals that are audible with the detector itself, whereas radio-frequency amplifies the signals before they are detected, mak-

ing possible signals that would not be audible without it. A hard amplifying tube such as the UV 201 or 201A is best for this purpose in the six-volt tubes. The transformer is optional—buy the best you can, as we do not recommend any types of competitive apparatus. An additional 22½ or 45 volt B battery in the plate circuit of the third tube will be necessary, as shown. It is questionable if a single step of radio added to the set you mention will increase your volume enough to enable you to operate a loud speaker. Radio-frequency does not increase volume so much as distance, and you will notice only a slight increase. With a set such as this, however, you should be able to get fair results on local stations with one stage of audio.

\* \* \*

In RADIO WORLD, June 23, you published a diagram of the D7 De Forest reflex circuit. Will this circuit produce as loud signals as a regenerative receiver using a detector and two steps of amplification? What capacity is the condenser between the secondaries of the third radio-frequency transformer and the crystal detector? Where can I purchase the .0015 condensers, as well as others of high values? Would separate rheostats for each tube rather than single control be of any advantage?—C. H. Barnett, Box 384, Hagerman, New Mexico.

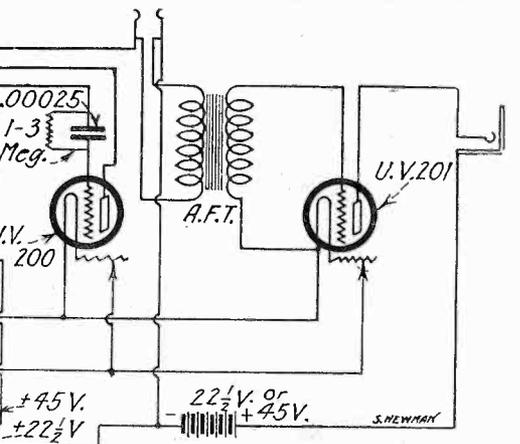
This circuit properly constructed and operated will produce louder signals and get further distance than the circuit you mention. When you are using a circuit of this type you are getting the practical use of six tubes, compared with the three

between a 23-plate .0001 and a 23-plate .005 condenser?—August Grubel, 331 East 38th Street, New York City.

It is of decided advantage to use bakelite in place of cardboard wherever it is possible in the construction of coils. We do not know that anybody is making condensers of the .0001 capacity with 23 plates, but answering your question regarding the difference between them it is that the capacity of the .005 is fifty times as great as the smaller. We are not aware that these condensers are sold on the open market in that value of capacity. The general run of 23 plate condensers is .0005 mfd, and that of the 43 plate .001. Short waves are generally considered as anything below 600 and long waves anything above that. Due to recent allocations, however, the waves around 200 meters may be considered as short waves, and those from 600 up as the long waves, while those in between would be classed as intermediate waves.

\* \* \*

Which of the two circuits, the Grimes inverse duplex or the improved Grimes duplex, is the best circuit for distance reception?—J. G. Jones, 3409 Beniteau Avenue, Detroit, Mich.

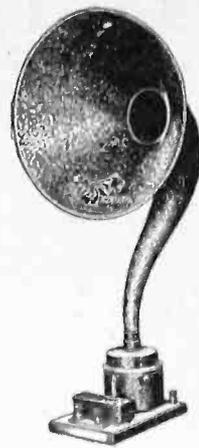


Circuit diagram asked for by Charles G. Rose. It is the Sorenson circuit with an additional stage of radio-frequency for distant reception. Extreme care should be taken in the rewiring of the circuit if good results are to be expected. Do not run wires parallel and watch your battery leads.

The Grimes inverse duplex is popular in two forms, the three tube and the four tube. You do not state which you mean. The improved Grimes as shown in RADIO WORLD is identical with the three tube set, the only difference being that Mr. Thompson has designed it to incorporate a stage of pure radio-frequency amplification ahead of the reflex tubes. Both are good sets.

# MAGNAVOX

## Radio Products



R3  
Magnavox  
Radio  
The  
Reproducer  
Supreme

### Make Your Receiving Set Complete

The efficiency of the Magnavox Reproducer is due to its principle of construction.

Only the Magnavox (electro-dynamic) reproducer can re-create broadcasted programs according to their original pitch, quality and volume.

Without Magnavox equipment, no Radio receiving set is complete.

Magnavox R3 Reproducer and 2 stage Power Amplifier . . . \$90.00

R2 Magnavox Reproducer with 18-inch curvex horn: the utmost in amplifying power; requires only .6 of an ampere for the field . . . \$60.00

R3 Magnavox Reproducer with 14-inch curvex horn: ideal for homes, offices, etc. . . \$35.00

Model C Magnavox Power Amplifier insures getting the largest possible power input for your Magnavox Reproducer.

AC-2-C, 2-stage, \$55.00  
AC-3-C, 3-stage, \$75.00

Magnavox Radio products can be had of good dealers everywhere. Write for copy of our new booklet.

The Magnavox Co.

Oakland, California  
New York Office: 370 Seventh Avenue

# Radio Merchandising

Advertising Rates: Display, \$5.00 an inch, \$150.00 a page. Classified Quick-Action Advertising, 5 cents a word.

Telephone Buant 4796

## Mayor Curley, of Boston, Makes Broadcasting Suggestions

EDITOR, RADIO WORLD: I beg to acknowledge receipt of your letter of recent date and replying thereto beg to state that, realizing the complications which have arisen on account of the increasing popularity of radio broadcasting and the evident necessity for some form of regulation or control, I am led to believe that eventually a municipally controlled broadcasting station in various cities of the country may be the means of meeting present conditions as well as provide for the future development of radio service.

Boston is fortunate in having at least two first class radio stations whose broadcasting is known throughout the country, besides the Government station controlled by the Navy. So long as these stations serve the requirements and continue to be as willing as they have been heretofore to co-operate with any municipal requirement I hesitate to suggest that the City of Boston establish its own station at this time.

I believe that the real solution of the radio broadcasting situation is to have the proper national government agency plan for the proper supervision and regulation of this service as it already does in some matters and should with regard to a great many more matters in which the service and welfare of the people are concerned.

Very truly yours,  
JAMES C. CURLEY,  
Mayor.

Boston, Mass.

## A Loud Speaker Tip

MANY times when a loud speaker is used with two steps of audio-frequency amplification, the diaphragm of

the loud speaking phone has a tendency to rattle. If the loud speaking phone is of the type that resembles a regulation telephone and the diaphragm can be removed, cut a small washer of thin cardboard just the size of the phone and about the thickness of the rim of the phone, and place it under the diaphragm. This will lift the diaphragm above the pole pieces of the magnets a slight bit and stop the rattle, which is caused by it hitting the pole pieces.

Do not use thick cardboard, or the distance will be too great and the sound will be impaired. The cardboard used by the laundries to keep shirt bosoms straight will be about right. Also be sure to keep the cap screwed on tightly or else the rattle will be worse than before.

## Another Appeal to Our Readers

EDITOR, RADIO WORLD: I am a cripple and have not walked, except on crutches, since I was nine years old. I am now 37. I have always been self-supporting since I was 15 until the last year. I am not able to get about very well. I have necrosis or tuberculosis of the bone.

I am very much interested in radio. I was thinking of making a crystal set, but since the discontinuance of KFAT at Eugene, Ore. (20 miles from here), I will have to have at least a single tube set, if I am to enjoy radio.

If any of the readers of RADIO WORLD who have some spare parts they no longer need will kindly send them to me, I am able to build a set myself. I sure will appreciate them. Respectfully yours,

C. R. COCHRAN.

Box 434, Cottage Grove, Ore.

(RADIO WORLD has investigated Mr. Cochran's statements and finds them correct. His case seems to be deserving. Readers who care to accede to his request are advised to correspond directly with Mr. Cochran.—Editor.)

## Radio Literature Wanted

Manufacturers of and dealers in radio apparatus and accessories are notified that literature and catalogues describing their products have been requested, through the Service Editor of RADIO WORLD, by the following:

- George Usher, Box 63, Miami, Fla.  
J. J. Borris, 508 North Fifth St., Harrison, N. J.  
Franklin Washburn, 1240 Allston St., Houston, Texas.  
W. T. Praster, 46 North Main St., Pleasantville, N. J. (Retailer.)  
Dr. O. E. Johnson, Rock Rapids, Iowa.  
S. C. Quinn, Northern Pacific Ticket Office, Bismarck, North Dakota.  
Robert A. Sage, 223 North Fourth Ave., Washington, Iowa.  
V. M. Smith, 309 West Latham Ave., Hemet, California.  
Martin N. Jefferson, 2920 East 97th St., South Chicago, Ill. (Will soon open large radio service station. In market for radio goods of all kinds.)  
George M. Butler, 5 Ashland Terrace, New Bedford, Mass. (Wants low cost crystal set for mail order trade.)  
Fred Cochran, Jr., A. I. R. E., 137 East 122nd St., New York, N. Y.  
James Boa Company, Ltd., 10 St. Sophie Lane, Montreal, P. Q., Canada. (Will do a strictly wholesale radio business. Want lowest jobbing prices from manufacturers.)  
George T. Zaffer, Winston Electric Co., 75 Union St., Flushing, N. Y. (Distributor and retailer.)  
The H. Wellman Electric & Mfg. Co., Ashland, Ky. (Has organized a radio department and will soon stock up for early fall trade.)  
Ivan H. White, 315 Joseph St., Charleston, W. Va.  
H. H. Rockenbach, Fairbury, Ill.  
J. A. Hawthorne, 3049 Ocean Ave., Brooklyn, N. Y. (Distributor.)  
Joseph Powers, 51 Gardner St., Allston, Mass.  
C. E. Whalen, North Amherst, Mass.  
Jos. A. Cross, 428 East Lane Ave., Columbus, Ohio.

## Coming Events

AMERICAN RADIO EXPOSITION, Grand Central Palace, New York City, October 6 to 13, 1923. J. C. Johnson, general manager.

ANNUAL HOME AND CITY BEAUTIFUL EXPOSITION, featuring radio exhibits, Atlantic City, N. J., June 16 to September 8, 1923.

AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS, Pacific Coast convention, Del Monte, Cal., Oct. 2-5. F. L. Hutchinson, 33 West 39th St., New York.

A MERICAN RADIO RELAY LEAGUE, second national convention, Chicago, Ill., September 12-15, 1923. Chicago Radio Traffic Association, 959 The Rookery, Chicago, Ill.

## The Indorarial

THE C. B. Cooper Company, 154 Nassau street, New York City, are sole selling agents for the "Indorarial," which resembles a piece of wall paper with a metal strip at each end. It can be rolled up and carried, making a good aerial for a portable set. Placed in a closet or under a rug, it makes an efficient indoor aerial which is out of sight. Interesting results are obtained by various combinations of one or more Indorarials.

## Radio World's Remarkable Subscription Achievement

ONE of the most difficult things in the publishing business is the building up of a subscription list. A year ago subscriptions came tumbling into the office of RADIO WORLD. That was all very well, but we wondered at the time if it was simply evidence of the fact that everybody was radio crazy. Would RADIO WORLD stand the gaff when it came to renewals?

RADIO WORLD is standing it, and amazing those who have had years of experience in the publishing business. The large percentage of renewals received on expired subscriptions is extraordinary. An army of people not only subscribed for RADIO WORLD last year, but are renewing their subscriptions this year—even in

the summer time—in a manner seldom known in publishing experience.

In other words, RADIO WORLD has qualified. It has achieved that enviable position where it can say of its subscribers and newsstand purchasers with almost literal truth, "Once a reader, always a reader."

Ask the average publisher what he thinks of the statement that any publication can, besides daily adding new subscribers in large numbers to its list, induce almost 90% of its old subscribers to renew. Most publishers would say it is impossible. RADIO WORLD is doing it right now, and has the renewal orders to prove it.

THE BUSINESS MANAGER.

# Newark, N. J., Making 3500 "Bootleg" Vacuum Tubes a Day

By William McNeary

Radio Editor, Newark Sunday Call

THE bootlegging of vacuum tubes used in radio receiving sets has grown to be one of the most widely practiced and highly profitable by-products of prohibition. Its importance is second only to the business of rum-smuggling itself. With a potential market of nearly a million dollars worth of tubes per month, the radio bootlegger is playing a big game. His net profit is generally as large, if not larger, than that of the whiskey runner and his danger of apprehension and punishment seems much less.

Beginning about a year ago on a small scale with the manufacture of various crude types of tubes which were easily spotted, the radio bootlegger has developed his business to the point of so skilfully and accurately counterfeiting the products of several prominent manufacturers that only an expert is able to detect the difference. In the course of examining the receiving sets of about forty amateurs a day for the past year and a half, the Newark Sunday Call has been afforded an unusual opportunity of examining a large variety of vacuum tubes, and whereas it was formerly a very simple matter to detect a bootleg product because of its faulty construction, the job has now become one requiring the closest examination.

The manufacture of the so-called "standard" vacuum tubes is in the hands of a closely knit group comprising the General Electric Company and the Westinghouse Electric & Manufacturing Company, from whose factories come the UV200, UV201, UV201-A, UV199, WD11, WD12 and, in addition, a series of tubes used largely in transmitting circuits. These tubes are sold through the Radio Corporation of America to the jobbers and dealers of the country. From the General Electric factories also come a series of tubes identically the same as listed above, but bearing the trade designation C300, C301, C301-A, C299, C11 and C12 and the signature of E. T. Cunningham. These tubes are widely used on the Pacific Coast and have recently been introduced into New Jersey.

Another important manufacturer of standard tubes is the Western Electric Company, makers of the VT1 and VT2, used extensively by the Signal Corps of

the United States Army, the 216-A used as a power amplifier and the "N" (peanut) tube employed as a detector, as well as a radio and audio amplifier. The latter tube, although not sold for amateur and experimental use in this country has attracted considerable attention here. The interest thus aroused has been capitalized by the bootleggers, who have placed copies of this tube on the market.

The development of "standard" vacuum tubes to their present high point of efficiency has been achieved only after the expenditure of hundreds of thousands of dollars by the companies mentioned above. The patents resulting from this costly experimentation represent a form of protection for the manufacturer against the pirates of industry who seek to profit by the fruits of another's labor and brains.

Patents mean nothing to the radio bootlegger, however. Not only does he steal the fundamental principle which has taken a legitimate firm years to develop, but he completes the job to the last detail by counterfeiting the tube in size, shape and even in the design of the trademark.

Newark is reported to be the biggest source of bootleg vacuum tubes in the country, but, strangely enough, fewer bootleg tubes are sold in this city than in any radio center of its size and importance in the United States. The local public is afforded a large measure of protection through the integrity of the dealers and through the medium of the personal service feature of the Sunday Call's Radio Department, which is available for testing tubes and apparatus every day except Monday from 2 to 5 P. M. A constant watch over the radio market is maintained by the Call's staff for the protection and information of its readers. Because of this fact radio bootleggers find it more profitable to seek other dumping grounds for their products.

From a source believed to be very reliable the Sunday Call learns that there are approximately seven "factories" engaged in the manufacture of bootleg tubes in this city. The combined capacity of these plants is figured at 3,500 tubes a day. There are five additional factories in New York and Brooklyn, this latter group being capable of producing about 2,000 tubes a day.

The reason Newark is such a big manufacturing center for bootleg tubes is because this city and vicinity affords the greatest market for skilled labor and materials, vital necessities to the bootlegger. In Harrison, just across the Passaic River from Newark, is the General Electric plant, employing thousands of workers, mostly girls, on the various processes of vacuum tube construction. In Bloomfield, another suburban town, is the Westinghouse Lamp Works, also employing thousands of trained workers on radio tubes. In these factories inexperienced labor is taken and thoroughly trained in the delicate work of tube making. Once thoroughly trained and experienced, this labor is recruited by agents of the bootlegger who are known to have approached workers leaving the factories. Higher wages is the usual bait, but bonuses are offered to the girls skilled in the more delicate branches of the work.

With this labor at his command the bootlegger is better able to carry out the details of counterfeiting standard tubes. There have come to the attention of the Sunday Call some excellent copies of the UV199. It is difficult to tell the copy from the original. Its weakness is in its extremely short filament life, the average bootleg lasting only a few hours as against 1,000 hours, the normal service of a standard tube. The bootleg 199's examined have a higher rate of current consumption than the genuine and a low percentage of electron emission, which means poorer service. This is largely because the bootlegger is unable to obtain the proper filament material and is obliged to substitute a flattened platinum wire, which, incidentally, is also obtainable locally.

The counterfeit UV199 is distinguished by the fact that the R. C. A., G. E. and W. trademarks impressed in white on the glass may be erased by rubbing a moistened finger over them. On the genuine these trademarks are etched on the glass and cannot be removed. The printing on the base of the tube is frequently badly smudged on the bootleg, whereas on the genuine it is quite clear and readable.

In addition to counterfeit UV199, the Sunday Call has discovered fake Western Electric "N" tubes, UV200 and UV201, DeForest DV6, WD12 and UV201-A.

## Radio Trade Notes

Frank La Valle, 2529 Cambrilling Ave., New York City, informs RADIO WORLD that he would like to go into the radio retail business and wants to hear from manufacturers of parts.

\* \* \*

C. B. Gowan and R. L. Lockett, 515 Galveston Ave., Fort Worth, Texas, are in the market for radio supplies, especially parts.

\* \* \*

The L. C. Warner Co. has removed to large quarters at 305 Occidental Ave., Seattle, Wash.

A. W. Stitt & Co., 127 York St., Sydney, Australia, want to import all kinds of radio apparatus.

\* \* \*

Sterling Miles Radio Co., 288 Judson St., Pontiac, Mich., is in the market for parts, radio books and mailing lists.

\* \* \*

Geo. W. Reeffin, 41 Fifth Ave., Brooklyn, N. Y., wants electrical measuring instruments, coils and other parts.

\* \* \*

Shippard Radio Co., 315 East State St., Jacksonville, Ill., wants prices on an extensive list of parts.

## New Radio and Electric Firms

Tel-U Signal Corp., New York City, electrical devices, \$600,000; V. Taylor, J. F. Hughes, R. L. Deely. (Attorneys, Phillips, Leibell & Fielding, 54 Chambers St.)

International Electrical Supply Co., New York City, \$25,000; W. P. Plummer, P. R. Cornelius, J. C. Lerentzen, Jr. (Attorney, F. J. Knorr, Albany, N. Y.)

Knickerbocker Radio Equipment Corp., New York City, \$5,000; M. Finkelstein, H. Sallinger, E. Rosenbaum. (Attorneys, Goldstein & Goldstein, 366 Broadway.)

N. Hirschfeld Electrical Supply Co., New York City, has changed its name to Hirschfeld Electrical Supply Co.

## The Condenser Sensation of Modern Radio



Through the accuracy and dependability of Freshman Condensers, hook-ups and circuits have been perfected which have completely revolutionized the art of Radio Reception.

*These little Storers of energy and recifiers of Radio Current are the very heart of a well-built radio set.*

The proper fixed condenser will make all the difference in the world in the reception, clarity and selectivity your set affords.

Capacity	Each	Capacity	Each
.0001	\$.35	.002	\$.40
.00015	.35	.0025	.50
.00025	.35	.003	.60
.0003	.35	.004	.75
.00035	.35	.005	.75
.0005	.35	.006	.75
.0006	.40	.01	1.00
.0008	.40	.015	1.50
.001	.40	.02	2.00
.0015	.40	.025	2.50

The FRESHMAN is so designed that constant equal pressure is exerted on the condenser plates over the entire area. They are the only condensers that do this and therefore the only condensers that avoid noises, which are due to variable pressure on the plates.

At your dealers, otherwise send purchase price and you will be supplied postpaid.

**Chas. Freshman Co. Inc.**  
Radio Condenser Products  
106 SEVENTH AVE., NEW YORK

## Public Health Service Warns Against Poison Ivy and Poison Oak

VACATIONISTS who carried their radio receiving sets with them on their jaunts this summer are not suffering from the want of advice on health. Thirty broadcasting stations in addition to NAA, Naval Radio Station, Arlington, Va., have been releasing health hints for vacationists furnished by the Bureau of the United States Public Health Service at Washington. The most recent of these broadcasts on the subject of poison ivy is especially timely, since every summer brings its toll of suffering from this cause.

The poison ivy is perhaps the plant most frequently encountered by the unsuspecting city visitor to the country, says the Public Health Service. Yet it may be easily distinguished from other creepers by its three divided leaves. The harmless creepers have five leaves. This one distinguishing mark if borne in mind will protect the vacationist from poison ivy. Poison oak is a shrub or small tree with broad leaves very much resembling the leaves of the oak tree.

The part of these plants to be feared is the resinous sap. When a plant is injured this sticky sap exudes. It comes in contact with the skin and sets up an irritation which is distinguished by its acute character. This irritation frequently begins between the fingers.

The symptoms of ivy poisoning are comparatively easy to recognize. A more or less mild attack may be ushered in by a burning or itching of the skin. Within twenty-four hours after the skin is exposed to the poison of the plant, a red rash appears. This is followed by small or less swelling and itching; then small blisters filled with serum make their appearance. The parts of the body affected may swell to enormous proportions.

At one time it was believed that many persons who had suffered from attacks of ivy poisoning would experience a recurrence of the attack if they passed through a wood or came into proximity with the plant even though the ivy itself was not touched. It now appears certain, however, that contact is necessary in order to produce ivy poisoning.

Ivy poisoning, says the Public Health Service, may sometimes be averted even after these plants have been handled provided the parts exposed are washed thoroughly with soap, water and alcohol. This washing must, however, be thorough, otherwise it will only tend to spread the irritating poison.

The treatment of ivy poisoning is simple and easily administered. One of the best treatments is bathing with salt water. Sea water is best if it is available. Another good application consists of one teaspoonful of boric acid in a quart of hot water. The affected parts should be bathed with warm water every day or every two days and carefully dried without rubbing. Bathing should be followed by another application of boric acid. The attack may subside in from four to six days. The best advice to vacationists is, study the poison oak, the poison ivy and the poison sumac so you may distinguish these plants from their neighbors. Once you are able to recognize them you can scrupulously avoid them. Avoid the creeper with the three divided leaves. Avoid the small shrub with the broad leaves like the oak. Give the sumac that grows in swampy places a wide berth. Persons who have suffered from plant poison do not soon forget the experience.

## RADIO TUBES REPAIRED \$2.00

New filaments inserted in

U.V. 200-C. 300	\$2.00
U.V. 201A-C. 301A-U.V. 199-C. 299-D.V. 6A	3.00
U.V. 201-C. 301-D.V. 6	2.25
U.V. 202-C. 302	3.00

WD11-12, VT-1, VT-2, VT-216A Not Accepted

24 Hour Service, and on the Above Types ONLY.

Terms—Cash with order. We will ship C. O. D. if 1/3 price is remitted with order.

All tubes are guaranteed to operate like new and to arrive in good working order.

**DEAL DIRECT !!**

SPECIAL—Ship us 5 of the above named tubes and we will ship by return mail one repaired tube FREE of all cost. What do you say? Swap?

Send all tubes parcel post prepaid to

**Radio Tube Repair Co.**  
192 Main St., Milford, Mass.

## AN AUDIO FREQUENCY TRANSFORMER THAT IS WORTH WHILE ALEMCO



Specially designed to produce superior results with any standard tube.

Produces maximum amplification without distortion or howling. Moisture, hard knocks and abuse will not affect its efficiency.

Windings completely surrounded with laminated iron and sealed in a non-inductive bakelite housing eliminating leakage. Adaptable to any stage of amplification.

Ratio 4 to 1

The Alemco Coil also gives equal or better results on the first stage than transformers on the market wound as high as 9 or 10 to 1.

Will stand any voltage.

Price, \$5.50 Postpaid

ALEMCO, Poughkeepsie, N. Y.

## SID'S RADIO DIARY

Keep a record of what you hear, when you hear it, what you can expect to get at any hour of any day. Sid's Radio Diary has a place for every kind of record you want to keep, all in one cover—radio golf scores by day and total, expense record, dial settings, programs, everything. Only complete radio diary published. 128 big pages, good paper, in heavy, durable cover. **\$1.00 Postpaid**

AGENTS WANTED—Liberal agency plan sent to every purchaser on request, with credit coupon to apply on quantity order. Send for one today.

SID NEU

390-A Lafayette Place

Milwaukee, Wis.

## YOU DON'T NEED

**Tubes** to get out of town. Even in the summer I hear Omaha, Kansas City, Fort Worth and Davenport on my crystal set without amplification. Works over 1,000 miles in winter. Send self-addressed envelope for further information or \$1.00 for complete copyrighted drawings and instructions. Everything clearly explained. Satisfaction GUARANTEED. Leon Lambert, 562 South Volusia, Wichita, Kan.

## RUSONITE

CRYSTAL RECTIFIER

(Patent Pending)  
THE PERFECT SYNTHETIC CRYSTAL DETECTOR—SENSITIVE OVER ENTIRE SURFACE No Hunting for "Spots." Loud and Clear. Endorsed by Thousands of Satisfied Users. Sensitiveness Guaranteed Price Mounted **50c**

14 K. Gold Supersensitive RUSONITE CATWHISKER, Price Permanent. Will not Oxidize. **25c**

RUSONITE REFLEX CRYSTAL Manufactured Expressly for Reflex Circuits. Will Stand Up Under Heavy Plate Voltage. Price Mounted **\$1.00**

Order from your dealer or direct from RUSONITE PRODUCTS CORP. 15 Park Row New York, N. Y.

## A Booklet You Will Want

By W. J. Merritt Garvey, of New York World's Radio Section, Handbook of Helpful Hints for Radio Set Builders, includes tables, charts, legends, statistics and carefully selected hookups with diagrams and full descriptions. Reading this interesting book we discovered Mr. Garvey recommended the FIL-KO-STAT. We bought an edition of the books and will gladly send a copy anywhere at handling cost 10c. postpaid. RADIO STORES CORPORATION, Inc. Sole International Distributors for

**FIL-KO-STAT**  
Filament Control of Infinite Adjustment  
Dept. RW-811-218 West 34th St., New York

## Federal Standard Radio Products

Standard of the Radio World, 100 separate units, each fully Guaranteed.

Write for Catalog.

Federal Telephone and Telegraph Co.,  
BUFFALO, N. Y.

## A \$300 Prize Contest for Radio Music

DO we have our jazz regularly with our bedtime story or not? That is the question that now confronts hundreds of thousands of families who have invested in radio receiving sets as they sit back awaiting the result of the broadcaster-music trust controversy.

It started with the sort of half scared claim of the publishers and authors of popular music several months ago, that the use of their compositions for radio broadcasting purposes was detrimental to its sale and, incidentally, disastrous to the profit sides of their ledgers.

The broadcasters, rendering a free service to the public, contended that the broadcasting of these compositions could have but one effect upon them—an increase in their popularity with an according increase in their sale. And so the matter stood for several months.

The claim of the publishers has ceased to be a whimper. It has now developed into a demand, a bold demand for royalties that, if necessary, will be backed to the limit by legal action.

With locked horns the opposing factions are now marking time and in the meantime the great fraternity of radio fans sits back and awaits judgment on what, to them, is an important question.

*Radio News*, a publication devoted to the interests of radio, has stepped in, not to referee the bout, but to attempt to solve what is a problem of concern to hundreds of thousands of families that have made room, at more or less expense, for this new means of emanating canned music. A decision negative to the interests of this great fraternity will undoubtedly bring about even a greater wail than that of the dreaded static or ether hog.

The solvent, that purposed to unlock the horns and bring the controversants to a state of amiability and more congenial relationship will be the publication, by *Radio News*, of two musical compositions, one a march and the other a "jazz" piece, which will be chosen in open competition, and promoted entirely by radio.

The popularity of these songs, the success of their sale, will be traceable directly to their use as radio broadcasting selections as they will not be promoted through any other medium. This success, which seems to be measured by the number of office boys who whistle it, will be the proof of the contention that radio broadcasting helps to "make" a song.

In the September issue of *Radio News*, Mr. H. Gernsback, editor of that publication, states, editorially, that radio has made many a bad show good and has had the same effect upon music, that is, radio has not changed the quality of either but it has done much to increase attendance and sale of good shows with poor attendances and good music with poor sales records.

Those who will judge the contest will be Hugo Reisenfeld, conductor of the orchestras of the Rialto, Rivoli and Criterion theaters of New York; Ted Lewis, of the well known Ted Lewis band and Ted Lewis Frolics; Vincent Lopez, director of the Hotel Pennsylvania orchestra, New York; Milton J. Cross, announcer of radio broadcasting station, AJN, New York, member of the Institute of Musical Arts and of Paulist Choristers; Leo B. Riggs, musical director of the Hotel Astor Bands, and H. Gernsback, editor of *Radio News*.

Three hundred dollars in prizes will be awarded in the contest, one-half for the best composition in march time and a like amount for the best composition in "jazz" time. The winning contestants will also be paid a generous royalty upon the sale of their compositions so that two new popular song writers will also be "made" by radio if the plan of *Radio News* is successful.

The conditions of the competition, as mentioned in the September issue of *Radio News*, follows:

1. Each composition to be not longer than the usual four pages.
2. Contestants may send in more than one composition. There is no restriction as to number.
3. All compositions to be executed in the usual manner, using the usual musical symbols.
4. Compositions to be entitled "Radio March" or "Radio Jazz," as the case may be.
5. Authors unable to write down music themselves, may have a musician do this for them.
6. All manuscripts to be submitted flat, not rolled.
7. All manuscripts not accepted will be promptly returned to the owners at the conclusion of the contest, provided sufficient postage is enclosed with the manuscripts.
8. All prizes will be paid upon publication.
9. This contest closes in New York on October 1, 1923.
10. Address all contributions to Editor, Radio Music Contest, *Radio News*, New York.

**DON'T WAIT**  
SPECIAL INTRODUCTORY OFFER  
BRAND NEW  
**\$26.98** (Type R-3) **\$26.98**  
Magnavox Loud Speakers  
**COREY HILL BATTERY CO.**  
1354 Commonwealth Ave. Boston 34, Mass.

**WORTH SENDING FOR!**  
New Duo-Control Reinartz Receiver  
The latest achievement in simplified control. Two dials control a super-selective three circuit receiver. Simple to build and simple to operate. Complete blueprints, including full size panel layouts, 50c.  
**RADIO EQUIPMENT CO.**  
727 W. 8th St. JUNCTION CITY, KANS.  
"Yes! We have the parts!"

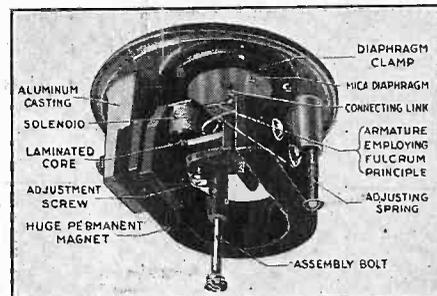
  
**ON APPROVAL FOR 30¢**  
**ZOBEL-STEIN LABORATORIES**  
322 9th ST. BROOKLYN, N.Y. SOUTH 2650

## THE TRINITY LOUD SPEAKER



**TYPE "A1"**  
**21" FIBER HORN**  
**\$25.00**

**TYPE "B"**  
**(For Phonographs)**  
**\$12.50**



INTERIOR CONSTRUCTION

An ear phone is an ear phone no matter how fancy the horn that covers it may be, and, due to the delicate construction of an ear phone it is utterly incapable of giving true tone reproduction, especially, when relatively large currents are passed thru its coils, such as the output of a two-stage or power amplifier.

The Trinity Loud Speaker element embodies the well-proven and tested principles of the phonograph reproducer with the soundest principles of electromagnetic design best adapted for loud speaker operation. It is not an ear phone when placed on a head band and a loud speaker when covered with a horn. It is a sturdy loud-speaking element ALWAYS.

Send for Literature.

## TRINITY RADIO CORPORATION

168 DARTMOUTH STREET, BOSTON, MASS.

**FILL OUT AND MAIL NOW**

**SUBSCRIPTION BLANK**

# RADIO WORLD

RADIO WORLD

1493-Broadway, New York City

Please send me RADIO WORLD for ..... months, for which

please find enclosed \$.....

**SUBSCRIPTION RATES:**

Single Copy .....\$ .15  
Three Months ..... 1.50  
Six Months ..... 3.00  
One Year, 52 Issues..... 6.00  
Add \$1.00 a Year to Foreign Postage; 50c for Canadian Postage.

## Sleeper's Two Latest Radio Books

Two new and remarkably good radio books by M. B. Sleeper—one is entitled "Six Successful Radio Sets," with design data and instructions for receiving sets specially selected for exceptionally long distance reception. The other is "101 Receiving Circuits," being a most complete compilation of diagrams including circuits for a regenerative, superregenerative, Reinartz, Flivver, Flewelling, super-heterodyne, reflex and radio frequency sets. Each book mailed on receipt of fifty cents and ten cents extra for postage. Both books for \$1.00 and no extra charge for postage. The Columbia Print, 1493 Broadway, New York City.

### SPECIAL OFFER

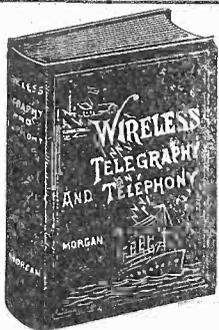
#### TO NEW RADIO WORLD SUBSCRIBERS:

Send \$6.00 for yearly subscription for Radio World (52 numbers) and these two Sleeper Radio Books will be sent you free, parcel post prepaid. This offer good only until September 1, 1923. If you are already a subscriber, send \$6.00 NOW for a renewal and books will be sent you.

IF YOU ARE INTERESTED IN RADIO YOU NEED THESE BOOKS

## Radio Books for Your Vacation

Telling How to Operate a Radio Set—How to Build a Set—Principles of Vacuum Tubes and Other Radio Problems



### Wireless Telegraphy and Telephony Simply Explained

By ALFRED P. MORGAN

One of the most complete and comprehensive treatises on the subject ever published. A study of its pages will enable one to master all the details of the wireless transmission of messages. The author explains in simple language the theory and practice of wireless telegraphy and telephony. 154 pages, 156 engravings.....PRICE \$1.50

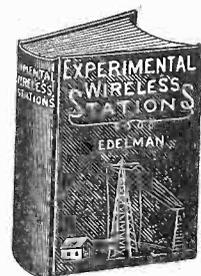


### The A B C of Vacuum Tubes Used in Radio Reception

By E. H. LEWIS

Assoc. I. R. E., and Radio Instructor

Written particularly for the person who "knows nothing about radio," but who would like to gain an understanding of the elementary principles of operation of vacuum tubes and various circuits in which they are used for the reception of radio-telegraph signals and radio-telephone music and speech. Illustrated.....PRICE \$1.00



### Experimental Wireless Stations

By P. E. EDELMAN

Tells how to make apparatus to not only hear all telephoned and telegraphed radio messages, but also how to make simple equipment that works for transmission over reasonable long distances. Then there is a host of new information included. The first and only book to give you all the recent important radio improvements, some of which have never before been published. 392 pages, 167 illustrations.....PRICE \$3.00

☐ The 3 Books for \$5.00 to One or Different Addresses

Any of These Books Sent Prepaid on Receipt of Price

ADDRESS **THE COLUMBIA PRINT**  
ROOM 326, NO. 1493 BROADWAY, NEW YORK

# LATEST BROADCASTING MAP IN COLORS FREE to RADIO WORLD SUBSCRIBERS

The latest radio broadcasting map of the United States and Canada, containing all the new allocations and changes, is offered *free* to subscribers for Radio World who send in their subscriptions within the coming four weeks. This map is printed on fine map paper stock and has just the information you want regarding broadcasting stations throughout the continent, including army and navy stations.

If you are already a subscriber you can get this map by renewing your present subscription now.

Send direct to this office or you may subscribe thru your newsdealer who can send your subscription direct to us.

Use the coupon attached.

## RADIO WORLD FREE MAP SUBSCRIPTION BLANK

Radio World,  
1493 Broadway, New York.

For the accompanying \$3.00 please send me Radio World for six months (26 numbers) beginning with issue dated .....and also, without any expense to me whatsoever, the latest radio map as advertised.

Name .....

Address .....

City and State.....

If you wish two maps, one for yourself and one for a friend, send \$6.00 for a yearly subscription and the two maps will be sent to different addresses if you wish.

## Real Value of Radio to the Blind and Deaf

IN lieu of the inspiration which the artist derives from the up-turned expectant faces of her audience, the singer at the radio broadcasting station, if she has imagination, can picture hundreds of homes where sit invalids, blind men and women and even many deaf people, thrilled at her every note.

Letters which come to the radio broadcasting station emphasize the enjoyment which the "stay-at-homes" get from broadcast music. To many of them "air" entertainment is the only pleasure that breaks the monotony of passing time. To many radio brings for a time at least forgetfulness of suffering. One such letter is that received recently by the General Electric Company station WGY at Schenectady, N. Y., from a young blind woman who lives in Seneca Falls, N. Y. She was graduated from college after working her way through aided by the limited means of her parents. While taking a year's work in normal school to fit herself for teaching a serious illness brought on blindness. She had to provide a living for herself, her aged father and mother and she became a masseuse. Writing to WGY, she says:

"If you could know how much we enjoy the voice of the Schenectady station, you would be glad that God gave you such a gift. My father, who is very hard of hearing can hear you distinctly and knows your voice already although we are only two weeks old in the radio world. Father could get nearly all the service and sang the hymns with the choir.

"The work of massage is so very exhausting that even when there is an invitation to get some recreation, physical weariness makes it impossible to enjoy anything. The constant association with sick people, the worry of expense and the strain of trying to do things without sight, the care of a father who has been feeble a long time, and the anxiety of a mother 74 years old who has had to work so hard to serve a deaf husband and a blind daughter, all these things brought me to a dreadful state of mind, distrusting everybody and sorry for myself. No honors conferred on a celebrity could have given greater pleasure than the church service gave two people, one deaf and the other blind and hungry for something good and helpful. The talk which I heard about Christ and Christianity was a greater banquet than any that was ever spread before the greatest man.

"I do wish that some philanthropist who would like to do something for the blind would furnish radio sets to those who are less fortunate than I."

Subscribe for RADIO WORLD, \$6.00 a year, \$3.00 six months, \$1.50 three months.



Pruden Reliable  
Radio Specialties  
for Good Results

Dealers write today for  
our interesting proposition.

FREDERICK H. PRUDEN, Inc.  
993 Bergen Ave., Jersey City, N. J.

## 10 DAY EXTENSION SUNBEAM SPECIAL DICTOGRAPH PHONES

\$5.25  
BRANDES PHONES, \$5.00

Send us your address—Get our  
Special Weekly Offerings.

SUNBEAM ELECTRIC CO.  
71 THIRD AVE. 207 East 14th St.  
NEW YORK

## DX STATIONS ON A ONE TUBE SET

Easily Constructed by Anyone  
Guaranteed to Operate or Money Refunded

### COMPLETE PARTS

1 Genuine Mahogany Cabinet; 1 Drilled Hard Rubber Grade A Panel; 1 23-Plate Condenser; 1 Variometer; 1 Rheostat; 1 Tube Socket; 2 3-Inch Dials; 8 Initialed Binding Posts; 3 Lengths of Spaghetti; 3 Lengths of Bus Wire; 1 Grid Leak and Condenser; 1 Bezel; 1 Diagram Free.

Only \$8.50

Ask for free price list on all standard Radio merchandise. Orders promptly attended to.

## GLOBE RADIO SHOP

115-117 West 23rd St. New York, N. Y.

## AMATEURS! FANS! ATTENTION!

ALL BROADCASTING STATIONS—Complete with the call, location, wave length, frequency of the station, and power used started in Radio World of June 9.

This list is most complete, and no amateur or fan should be without it. It will be completed in following issues, and as revisions or changes are made the list will be kept up-to-date, so that you will always have an up-to-date list to which you can refer. Don't miss any issue. Send 15c to

RADIO WORLD, 1493 BROADWAY  
New York City, or start your subscription with that number.

DO IT NOW—DON'T DELAY!

## Do You Want LONG DISTANCE on Your Set?

The following stations have been heard with a COAST COUPLER

WDAP—Chicago  
CFCN—Calgary  
WWJ—Detroit  
PWS—Havana  
WSB—Atlanta

And Many More



The COAST COUPLER is a necessary part of your radio hook up. Manufactured of the best materials obtainable and thoroughly tested before leaving the factory, it has immediately won recognition in the radio market.

ANYWHERE IN THE UNITED STATES—\$5.00

Write for catalogue.

## COAST COUPLER COMPANY

245 EAST SEVENTH STREET

LONG BEACH, CALIFORNIA

## COMPLETE LIST OF BROADCASTING STATIONS

Appeared in Radio World Dated June 9, 16, and 23

Get these three copies and you will have the latest list of broadcasters published. 15c. a copy or the three for 45c. Or you may start your subscription with any number. RADIO WORLD, 1493 Broadway, New York.

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 and other fields. Readers of RADIO WORLD will find that it pays to read these columns every week. Advertisers will get an eight-day service here—that is, copy received for this department will appear in RADIO WORLD on the news-stands eight 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 eight days before publication. RADIO WORLD, 1493 Broadway, N. Y. C. (Phone, Bryant 4796).

**WANTED**—One K. W. used Navy Quenched Spark Gap. Also Price wanted. Harvard Radio Laboratories, P. O. Box 1781, Boston, Mass.

**60,000 MILES ON A HOME-MADE RECEIVER.** 2,600-mile range. 100 station log and hook-up for the asking. Maitland Roach, 2908 Columbia Ave., Philadelphia, Penn.

**150 FUNNY PARODIES** on latest songs, 25c. Book catalog, 2c. R. W. Collins Co., 197 Fulton St., Brooklyn, 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, La Roy, N. Y.**

**VACUUM TUBES REPAIRED.** Reasonable. Send for our price list. Vacuum Electric, Station C, Toledo, Ohio.

**LONESOME! MAKE NEW AND TRUE FRIENDS.** Confidential. Write **DOLLY GRAY AGENCY, Box 186B, Denver, Colo.**

**SUPER-SIMPLICITY CIRCUIT**—1,000 to 1,300 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.**

**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.**

**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.**

**EDISON Elements** for making "B" Batteries, 6c per pair; tubes, 2c each. Nickel Wire, Insulators and Cabinets at reasonable prices. **TODD ELECTRIC CO., 178 Lafayette St., New York City.**

**RADIO "TROUBLE FINDING" CHART.** It locates immediately the trouble in your radio set! Sent Postpaid 25 cents. The Radio Service Shop, 496 Provident Ave., Winnetka, Ill.

**CALLS HEARD POSTAL CARDS** for DX reports. Station call letters in color. Printed on government or plain postals. \$.80 hundred up. "Used Everywhere—Go Everywhere." Write for samples. Radio Print Shop, Box 582, Kokomo, Indiana.

**GUARANTEED BAMBOO FOUNTAIN PEN.** Non-corrosive pen point. Will not scratch or leak. Writes carbon copies. Price \$1.00. Stamps not accepted. Atlas Novelty, Box 355, Beverly, Mass.

**MAGNAVOX TYPE R3.**—Latest curves, improved acoustic models, in original sealed factory cartons. List \$35. Introductory offer \$25. **RADIO CENTRAL, Dept. W, Abilene, Kans.**

**EVERY RADIO FAN** should have these two books, "101 Receiving Circuits" and "Six Successful Receiving Sets." By M. B. Sleeper. They are the most up-to-date radio books for the fan who likes to make his own, and will help you out and save you many times their cost. Both books are full of illustrations. Price, 50c. each, with 10c. extra for postage, or both for \$1.00 sent postpaid. **COLUMBIA PRINT, 1493 Broadway, New York City.**

**CALLS HEARD CARDS** for DX reports. Station call in color. Printed on government postals or bristol cards. \$.80 hundred up. Samples. "Used Everywhere—Go Everywhere." 9AVO, 746 So. Armstrong, Kokomo, Indiana.

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

**CUTTING AND WASHINGTON** detector and 2-stage audio amplifier complete with tubes, B Batteries, Storage Battery (100 ampere hour), two sets phones, Dictograph Loud Speaker. Range, 2,200 miles. \$75.00. K. C. Matheson, Box 186, Clinton, Nebraska.

**BROADCASTING POST CARDS**—Receiving Station Cards and Sending Station Reply Cards, per dozen, 15c. Peanut Set, everything complete, \$30. Cabinet Crystal Sets, \$3 to \$5. Stamp for catalog. **PACIFIC SCREW CO., Dept. R, 645 N. E. 53rd St., Portland, Ore.**

**EXCHANGE JOLLY, INTERESTING LETTERS THROUGH OUR CLUB.** Betty Lee, Inc., 4254 Broadway, New York City. Stamp appreciated.

## RADIO DEALERS ! ! !

Have you seen the list of Camps and Camp Directors which started in the MAY 12 issue of RADIO WORLD? Here is a list of all the Camps and Directors of camps in the United States, and is of essential value to any Radio Merchant who is anxious to enlarge his summer business. Get these people interested in installing radio sets in their camps for the benefit of the campers. Any single copy, 15c; or the four issues for 60c. **RADIO WORLD, 1493 Broadway, New York City.**

**STANDARD ELECTRICAL DICTIONARY.**—By Prof. T. O'Connor Sioane. Just issued an entirely new edition brought up to date and greatly enlarged—Price, \$5.00. The Columbia Print, 1493 Broadway, New York City.

## ELEMENTS OF RADIO TELEPHONY

By WILLIAM C. BALLARD, JR.

Assistant Professor of Electrical Engineering, Cornell University

This is a standard book on radio telephony, the work of a recognized authority.

It is accurate, simple, clear, reliable and strictly up to date.

The man with a technical background who wants to post himself on radio will find this exactly the book for his purpose.

The radio enthusiast will find in it an excellent presentation of fundamental principles and their application.

SENT POSTPAID ON RECEIPT OF PRICE, \$1.50, BY  
**THE COLUMBIA PRINT, 1493 B'way, New York City**

## DID YOU GET THE VACATION NUMBER OF RADIO WORLD

It had page after page of interesting and practical ideas and hook-ups for people who are going camping, canoeing, yachting, or just vacationing up in the mountains. You really can't afford to be without it, if you intend leaving the city behind this summer and want to take your radio with you. Dated June 2. Mailed for 15c.

Radio World, 1493 Broadway, New York City

## HOOK-UP AND CIRCUIT HOUNDS

Did you miss it? Do you want it? If you do you can get it by writing in to Radio World for any one of these back numbers, as per dates:

Good 2 tube WD-11 Circuit for DX.....	Jan. 27
Batteries Circuit.....	Feb. 8
G. W. May's Wonder Circuit.....	Feb. 17
Multi-tube Reflex Circuits.....	March 8
One tube Superegnerative.....	March 8
Lewis Three Tube Circuit.....	March 10
Regenerative Radio Frequency Circuit for 5 tubes.....	March 24
Hazeltine Neutrodyne Receiver.....	March 31
2VK's Transmitter circuit.....	April 21
Compact Universal Receiver.....	April 28
Stockelburg Pup receiver.....	May 5
Cockaday receiver.....	May 12
Improved Grimes Circuit, A. D. Turnbull's Long Distance Circuit, Combined Receiver and Transmitter, Improved 1 tube Blenartz.....	May 19

Any number for 15c. Any 7 numbers for \$1.00. All 12 numbers for \$1.50. Or start subscription with any number. Radio World, 1493 Broadway, New York City.

## RADIO FANS

Do you want to sell your old set?  
Do you want to exchange anything for something?  
Do you want to buy something?

If so, why don't you use the Classified Department of Radio World? You can get fine results for five cents a word, minimum ten words. Your message will reach thousands including other fans, dealers, etc., etc.

Try Radio World's Classified Department for your personal radio and other needs.

**RADIO WORLD, 1493 Broadway, New York City**

# TECHNICAL BOOKS FOR RADIOISTS, ELECTRICIANS, AND OTHERS

Construction of Radio Phone and Telegraph Receivers for Beginners—By M. B. Sleeper.....	\$0.75
Ideas for the Radio Experimenter's Laboratory—By M. B. Sleeper.....	.75
The Radio Experimenter's Hand Book—By M. B. Sleeper.....	1.00
Radio Hook-Ups—By M. B. Sleeper.....	.75
Radio Design Data for Radio Transmitters and Receivers—By M. B. Sleeper.....	.75
Construction of New Type Transatlantic Receiving Sets—By M. B. Sleeper.....	.75
How to Make Commercial Type Radio Apparatus—By M. B. Sleeper.....	.75
A B C of Vacuum Tubes Used in Radio Reception—By E. H. Lewis.....	1.00
Wireless Telegraphy and Telephony Simply Explained—By Alfred P. Morgan.....	1.50
Experimental Wireless Stations—By P. E. Edelman.....	3.00
Six Successful Radio Sets—By M. B. Sleeper.....	.50
101 Receiving Circuits—By M. B. Sleeper.....	.50
Arithmetic of Electricity—By Prof. T. O'Connor Sloane.....	1.50
Commutator Construction—By William Baxter, Jr.....	.35
Dynamos and Electric Motors and All About Them—Dynamo Building for Amateurs, or How to Construct a Fifty Watt Dynamo—By Arthur J. Weed.....	1.00
Electric Bells—By M. B. Sleeper.....	.75
Experimental High Frequency Apparatus, How to Make and Use It—By Thos. S. Curtis.....	.50
Electricity Simplified—By Prof. T. O'Connor Sloane.....	1.50
Electrician's Handy Book—By Prof. T. O'Connor Sloane.....	4.00
Electric Toy Making, Dynamo Building and Electric Motor Construction—By Prof. T. O'Connor Sloane.....	1.50
House Wiring—By Thos. W. Poppe.....	1.00
How to Become a Successful Electrician—By Prof. T. O'Connor Sloane.....	1.50
Standard Electrical Dictionary—By Prof. T. O'Connor Sloane.....	5.00
Storage Batteries Simplified—By Victor W. Page, M.S.A.E.....	2.00
Telephone Construction, Installation, Wiring, Operation and Maintenance—By W. H. Radcliffe and H. C. Cushing.....	1.50
Wiring a House—By Herbert Pratt.....	.35
The Modern Gasoline Automobile, Its Design, Construction, Operation—By Victor W. Page, M.S.A.E.....	4.00
Hints and Tips for Automobilists—By Victor W. Page.....	.75
Questions and Answers Relating to Modern Automobile Construction, Driving and Repair—By Victor W. Page.....	2.50
Automobile Starting, Lighting and Ignition Systems—By Victor W. Page.....	2.00
Automobile Repairing Made Easy—By Victor W. Page.....	4.00
The Model T Ford Car, Its Construction, Operation, etc.—By Victor W. Page.....	4.00
Automobilist's Pocket Companion and Expense Record—By Victor W. Page.....	1.50
Location of Gasoline Engine Troubles Made Easy—By Victor W. Page.....	.35
Location of Carburetion Troubles Made Easy—By Victor W. Page.....	.35
Location of Ignition System Troubles Made Easy—By Victor W. Page.....	.35
Location of Cooling and Lubricating Troubles—By Victor W. Page.....	.35
Lubrication of the Motor Car Chassis—By Victor W. Page.....	.35
Location of Starting and Lighting System Faults—By Victor W. Page.....	.35
Location of Ford Engine Troubles Made Easy—By Victor W. Page.....	.35
Location of Motorcycle Troubles Made Easy—By Victor W. Page.....	.35
A B C of Aviation—By Capt. Victor W. Page.....	2.50
Aviation Chart—By Lieut. Victor W. Page.....	.35
Glossary of Aviation Terms—English-French; French-English—By Victor W. Page and Paul Montarlot.....	1.00
Westinghouse E-T Air Brake Instruction Pocket Book—By Wm. W. Wood.....	2.50
Machinists Shop Arithmetic—By Colvin-Cheney.....	.75
Practical Instructor and Reference Book for Locomotive Firemen and Engineers—By Chas. F. Lockhart.....	2.50
Gas, Gasoline and Oil Engines—By Gardner D. Hiscok.....	3.00
The Gasoline Engine on the Farm: Its Operation, Repair and Uses—By Xenos W. Putnam.....	3.00
Lathe Work for Beginners—By Raymond F. Yates.....	2.00
The Lathe—Its Design, Construction and Operation With Practical Examples of Lathe Work—By Oscar E. Ferrigo.....	3.00
Complete Practical Machinist—By Joshua Rose.....	3.00
Shop Kinks—By Robt. Grimshaw.....	3.00
Home Mechanic's Workshop Companion—By Andrew Jackson, Jr.....	.75
Machine Shop Tools and Shop Practice—By W. H. Vandervoort.....	4.50
The Naval Architect's and Shipbuilder's Pocket Book—By Clement Mackrow & Lloyd Wollard.....	6.00
Prospector's Field-Book and Guide—By H. S. Osborn.....	3.00
Model Making—By Raymond Francis Yates.....	3.00
Motor Boats and Boat Motors—By V. W. Page and A. C. Leitch.....	4.00
Popular Handbook for Cement and Concrete Users—By Myron H. Lewis.....	3.00
Punches, Dies and Tools for Manufacturing in Presses—B. J. V. Woodworth.....	4.50
Standard Electrical Dictionary—By Prof. T. O'Connor Sloane.....	5.00
A Course in Mechanical Drawing—By Louis Rouillon.....	1.50
Self-Taught Mechanical Drawing and Elementary Machine Design—By F. L. Sylvester, M.E.....	2.50
Practical Pattern Making—By F. W. Barrows.....	2.50
American Stationary Engineering—By W. E. Crane.....	2.50
Steam Engineer's Arithmetic—By Colvin-Cheney.....	.75
500 Plain Answers to Direct Questions on Steam, Hot-Water, Vapor and Vacuum Heating—By A. G. King.....	2.50
Standard Practical Plumbing—By R. M. Starbuck.....	3.50
Mechanical Drawing for Plumbers—By R. M. Starbuck.....	2.00

Any of these books sent prepaid to any part of the world on receipt of order in cash, check, stamps, express or postal order.

**THE COLUMBIA PRINT**  
1493 BROADWAY NEW YORK CITY

## RADIO WORLD

TELEPHONE, BRYANT 4706  
PUBLISHED EVERY WEDNESDAY (Dated SATURDAY OF SAME WEEK)  
FROM PUBLICATION OFFICE,  
1493 BROADWAY, NEW YORK, N. Y.  
BY HENNESSY RADIO PUBLICATIONS CORPORATION

ROLAND BURKE HENNESSY,  
President and Editor

M. B. HENNESSY, Vice-President  
FRED S. CLARK, Secretary and Manager  
1493 BROADWAY, NEW YORK, N. Y.

European Representative: The International News Co., Breems Bldgs., Chancery Lane, London, Eng. Paris, France: Brentano's, 37 Avenue de l'Opera.

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

### Field Representatives:

Chicago—Stevens & Baumann, Inc., First National Bank Building.  
Los Angeles—Stevens & Baumann, Inc., Higgins Building.  
San Francisco—Stevens & Baumann, Inc., Holbrook Building.

### SUBSCRIPTION RATES

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 square 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. 3% 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.

## Business Is Good!

UNDER the title "A Calm Review of a Calm Man," Samuel G. Blythe writes a most absorbing article in *The Saturday Evening Post* about President Harding, in the course of which he says: "This country, under Harding, has come to be the only legitimately prosperous country in the world. It doesn't take much of a memory to go back to 1921, nor much of a business training to realize that business was bad in this country at that time. Nor does it take much experience of economics or commerce, general trade, manufacturing or labor conditions to make it plain that this country, at this time, is really, legitimately, solidly and nationally prosperous. This prosperity is not sectional. It is not geographical. It extends from coast to coast, from the Canadian border to Mexico. Labor is universally employed at high wages. Money is plentiful. All lines of business are flourishing. And there is no other country in the world of which this can be said.

"That is the fact. Any banker will tell you so. Any business man will tell you so, any man of large affairs. Any workman will tell you he has steady work at high wages. Times are good. Trade in every line is good. The country is on the big up-swing.

"This isn't a past condition, nor a future condition. It is a present condition."—Reprinted by permission from *The Saturday Evening Post*. Copyright, 1923, by The Curtis Publishing Company, Philadelphia, Pa.

## PATENTS

promptly procured. Trade Marks designed & registered. FREE INVENTION RECORDING BLANK. Phone Vanderbilt 7212

FREE MANUFACTURERS PATENT CO., INC. 800K 520 FIFTH AVE. NEW YORK

"RADION," The Best Hard Rubber Insulation

**PANELS** **BLACK** **AND** **MAHOGANITE**  
DIALS—KNOBS

20 Stock Size Panels and Also CUT TO ANY SIZE

"Radion" Tubing: 2", 2½", 3", 3¼", 3½", 4", 5"

Cut to Any Length  
Special Parts Experimental Work Made to Order

N. Y. Hard Rubber Turning Co.  
212 CENTRE STREET NEW YORK

## WD-11 and WD-12 TUBES REPAIRED

WD-11 or WD-12.....	\$2.50
C-300 or UV-200.....	2.75
C-301 or UV-201.....	3.00
C-302 or UV-202.....	3.50
C-301A or UV-201A.....	3.50
Moorehead Detectors.....	2.75
Moorehead Amplifiers.....	3.00
DV-6 or DV-6A.....	3.00
Also the new UV-199.....	3.50

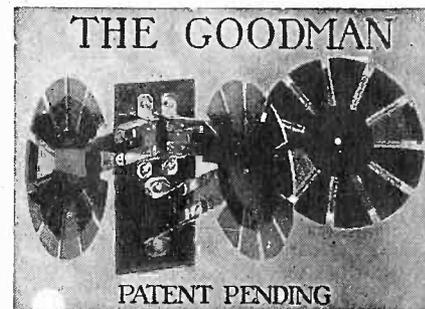
All tubes guaranteed to work like new.

Mail Orders Given Prompt Attention "24 Hour Service"

NEW DX 1½ VOLT TUBES..... \$4.00

## RADIO TUBE CORP.

55 Halsey Street Newark, N. J.  
TUBES SENT PARCEL POST, C. O. D.



The Niftiest Short Wave Tuner on the Market Only \$6.00 & PP on 1 lb. Send for pamphlet.

**L. W. GOODMAN**  
DREXEL HILL, PA.

The Goodman is really a high grade instrument, well and sturdily constructed. The PANEL and FANS are GENUINE BAKELITE—the best material known for the purpose.

## PATENTS

### To the Man with an Idea

I offer a comprehensive, experienced, efficient service for his prompt, legal protection, and the development of his proposition.

Send sketch or model and description, for advice as to cost, search through prior United States patents, etc. Preliminary advice gladly furnished without charge.

My experience and familiarity with various arts frequently enable me to accurately advise clients as to probable patentability before they go to any expense.

Booklet of valuable information, and form for properly disclosing your idea, free on request. Write today.

**RICHARD B. OWEN**

Patent Lawyer

58 Owen Building, Washington, D. C.  
2276-P Woolworth Bldg., New York City

# EXTRAORDINARY SUMMER SUBSCRIPTION OFFER

**Radio World and Other Popular Radio  
Publications for the Price of Subscription  
for Radio World Alone**

- Radio World has made arrangements  
—by which it is possible  
—to offer a year's subscription for  
—any one of the following publications  
—with one year's subscription for
- Radio World:
  - RADIO NEWS or
  - POPULAR RADIO or
  - WIRELESS AGE or
  - RADIO DEALER or
  - RADIO (San Francisco)

- This is the way to get two publications  
—for the price of one:
- Send \$6.00 today for Radio World
  - for one year (regular price
  - for 52 numbers)
  - and select any one of the other
  - four publications for twelve months—
  - This offer good only up to and
  - including September 15, 1923.
  - Present Radio World subscribers
  - can take advantage of this offer by
  - extending subscriptions one year NOW.
  - Or order thru your newsdealer.

-----

## RADIO WORLD'S SPECIAL TWO-FOR-PRICE-OF-ONE SUBSCRIPTION BLANK

RADIO WORLD, 1493 Broadway, New York City.

Enclosed find \$6.00, for which send me RADIO WORLD for twelve months (52 numbers), beginning ....., and also, without additional cost, Radio News, or Popular Radio, or Wireless Age, or Radio Dealer, or Radio for twelve months beginning .....

Name .....

Street Address .....

City and State .....

This Offer Good  
Only Until  
September 15, 1923

## What Is a "Radario"? Here's the Answer

T. C. O'DONNELL has written several plays and stories for children and spoken to a world-wide audience from Station WLW, Crosley Manufacturing Company, Cincinnati, "the station with a soul." His plays appear every month in *Child Life* magazine. He has made a study of the radarios written and produced at WLW, and has written the first original radario for children. This is called "The Magic Journey" and will be given in September from the broadcasting station.

There may be some new radio set owners who do not know that radario plays were originated by Fred Smith, director of the WLW studio, but most of the radio audience during the past year know about this and their enthusiastic letters have encouraged the production of these plays on even a larger scale than heretofore. Mr. O'Donnell, who is also editor of *Writer's Digest*, which is conducting a \$100 prize contest for the three best radarios submitted, has this to say about them:

"The word radario can best be defined by giving a brief history of the broadcasting of one-act plays, as written for and produced upon the stage. In this, station WLW was the pioneer. It was found that with the aid of occasional interpolations by the studio director, describing the entrance and exit of characters, and with each part given by a reader with a distinctive voice, it was possible to render the play so clearly that the listener could readily follow the play.

"But—directions by the studio director did interrupt the dialogue and the action of the play, and to that degree the play failed to be perfectly adapted to radio broadcasting. Mr. Fred Smith, studio director at WLW, hit upon a means of obviating this difficulty. His idea was so to construct the play that the dialogue would convey to the listener the entire action.

"For example, in a scene with two young women conversing about the young man whom they are expecting, upon his appearance the studio director in the regular play would have said: 'At this point Reginald Fairfield enters and greets the young women.' The radioized version would be something in this manner:

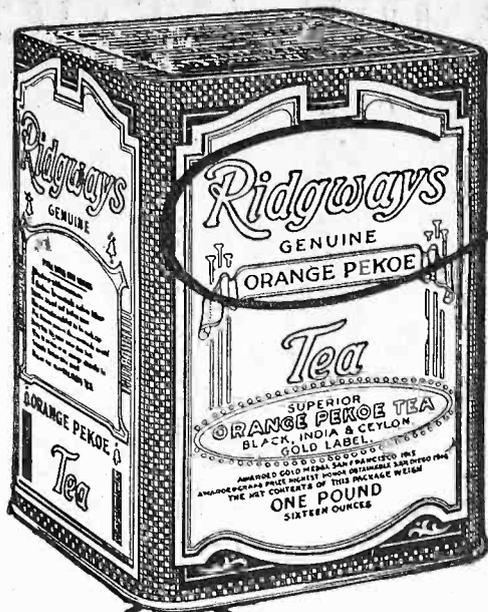
"PHYLLIS: Oh, here comes Reggie now! . . . Hello, Reggie!"

"REGINALD: Why, here you are! Hello, Phyllis! Hello, Dorothy!" and the dialogue would go on smoothly and the entire action be as clear to the listener as though the studio director, or 'descriptionist,' as he is now called, had described the action.

"To this new form Mr. Smith gave the name 'radario,' a word which has quickly become fixed in the language, so that the publishers of the Standard Dictionary have announced that the next edition of this work would contain the word and its definition.

"Mr. Smith also wrote the first radario, 'When Love Wakens,' the title initials being the letters which denote the station WLW. This was broadcast early in the year and was followed by other radarios, one of these being a clever radioization, if we may use the term, of Moliere's 'Trader Turned Gentleman.'

"An essential of the radario is that it tell a complete story; in other words, that it have a plot. Also it must be brief, not occupying more than twenty minutes on the program. And if variety is introduced in the form of a song by one of the performers, or a bit of orchestra music, or a novelty like a whistling solo, so much the better."



*Genuine*

## What IS Genuine Orange Pekoe?

IT has nothing to do with oranges. "Orange Pekoe" is simply an oriental term to denote one of the different gradings of tea. And here is the point you should keep in mind when you buy Orange Pekoe Tea—There are three distinct gradings:

- Flowery Orange Pekoe (tea of very finest quality)
- Broken Orange Pekoe (tea of very choice quality)
- Orange Pekoe (tea of average quality)

The first two grades are very much superior to ordinary Orange Pekoe. Ridgways *Genuine Orange Pekoe* is the finest tea procurable, because it is composed *only of the Flowery and Broken Orange Pekoes*.

Some teas marked "Orange Pekoe" have a very small proportion of Orange Pekoe. Right there is the value in getting *Genuine Orange Pekoe*.

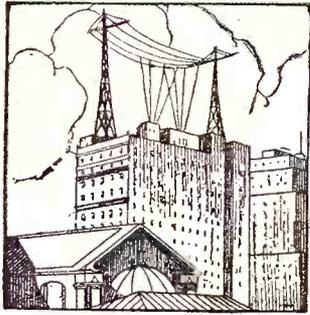
The way to make sure of *Genuine Orange Pekoe*, without any doubt about it, is to insist firmly upon *Ridgways Genuine Orange Pekoe*. Then you are certain to enjoy the superb flavor, the exquisite bouquet you should rightfully expect in this superior tea. Order definitely by name and insist upon getting it. *Ridgways GOLD LABEL Genuine Orange Pekoe*.

# Ridgways Tea

Sold Exclusively in Airtight Tins

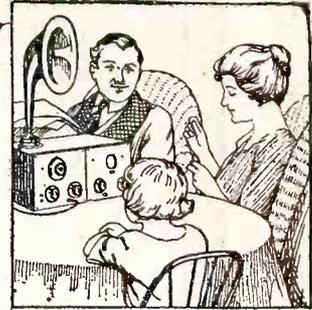
# Did You Read This Article

in



16 PAGES.

## The RADIO Sun-Globe



SECTION TWO.

ISSUED AS A SECTION OF THE SUN AND THE GLOBE.  
Copyright, 1923, by The Sun Printing and Publishing Association.

NEW YORK, SATURDAY, AUGUST 4, 1923.

### The Sleeper Monotrol

The First of a Series of Three Articles Describing the Construction of the Latest Type of Grimes Inverse Reflex Receiver

By DAVID GRIMES

WHEN a new radio circuit, however wonderful in its essentials, is put to the acid test of commercial use, then every little detail must be explored, and every difficulty located and solved in order to produce an instrument that Mr. Average man or woman can operate with full success and pleasure. Ever since that first announcement

small loops for reception, which were mounted in the aeroplanes directly behind the operator's seat, so that they could be rotated by him in the direction of maximum or minimum intensity. The set was placed beside the operator and the batteries at his feet. The problem of reducing weight in these bombing

This basic idea was not new, as it dated back to 1913 and 1914, with credit due to two Germans. These men had even taken out foreign patents, the United States patent having been granted to them in 1914. Most of the widely advertised one tube reflexes recently on the market are direct uses of the German basic idea showed

THIS was the first of three important articles describing the famous Grimes Inverse Duplex Circuit—latest and greatest of all 3-tube circuits as incorporated exclusively in the **SLEEPER MONOTROL**—“the most perfect radio set in America.”

Both the set and articles describing it have caused a stir in the leading radio publications throughout the country. We will be glad to send you our booklet describing its extraordinary features.

### Dealers

—will be particularly interested. They are looking for radio developments which have come to stay and the series of articles in “The Radio Sun-Globe” will convince the most skeptical that not only is the **SLEEPER MONOTROL** a distinct advance over previous sets, but a **permanent** advance—a fundamental principle. We will be glad to send complimentary reprints of these articles to all dealers who write for details of our special trade proposition.

### Sleeper Radio Corporation

88-W Park Place

New York

