

Radio Digest

EVERY WEEK

Illustrated

TEN CENTS

REG. U. S. PAT. OFF. & DOM. OF CANADA

Vol. V

Copyright, 1923
R. D. P. Co. Inc.

SATURDAY, JULY 7, 1923

No. 13

MOVIES SENT BY RADIO



AIR CHURCH ON WHEELS BUILT

WWJ ENGINEERS PUT SET ON TRUCK

Baseball Scores, Markets, Weather, Music, to Supplement Sermons

DETROIT.—Radio engineers from WWJ, the Detroit News broadcasting station, have converted a large motor truck into a Radio church for the Episcopal Diocese of Michigan. Vestrymen of St. Paul's Episcopal Cathedral, the services of which are broadcast every Sunday, turned over all its contributions from its Radio audience for this work. Some parts of the apparatus are loaned by manufacturers and retailers, but it is the aim of the church officials

Now we know why the devil enters our Radio sets these days. If you receive devilish music, just lay it to Miss June Farley, for she is the imp that sings at WJAX, Cleveland. Sorry we cannot show the bright red of the costume to make the picture more impressive

Photo by Radio Digest

Broadcasters of Britain Building Radiotheater

Take Step When Actors' Union Bars Members from Microphone

LONDON, ENG.—Because the Theatrical Managers' Association of London has decided to ban the broadcasting of plays, music, songs and other entertainments in which performers in employ of members of that body appear, the British Broadcasting Company is building a large new studio-theater from which to broadcast such entertainment. The company will organize playing troupes of its own and will engage independent singers, musicians and other entertainers. The studio-theater will be at Savoy Hill, a London district, and will be the first of its kind in the world.

Prize Set for Best Radio Record at Citizens' Camp

DETROIT.—General J. G. Harbord has announced that he will present to the young man who makes the best record in Radio at the Citizens' Military Training Camp at Custer, Mich., this year, an up-to-date Radio receiving set. This offer is open to amateurs in Illinois, Wisconsin and Michigan. The camp opens at Custer, August 1, and continues until September 1. General Harbord was, until recently, the deputy chief of staff of the Army.

FILM ON AIR EXPERIMENT PROVES GOOD

Small Box and Curtain May Soon Make Radio Visible in the Home

Plans City-to-City Test

Follows Up "Still" Photo Work Outlined Recently in Digest —Has War Uses

By Carl H. Buttman

WASHINGTON.—The near future will see the perfection of Radio movies; essentially, they are here today. Every "listener-in," with the aid of a special apparatus, contained in a box about a foot square and a small curtain, will be able to see as

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Rye bread and hot dogs go well together. This may be a dainty bit for a breakfast but it looks as if a good noon lunch could be made of it. The beaches draw many people these hot days and the Radio set is always in prominence, especially among movie actors. Miss Lucy Fox at the water's edge with her receiving set

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"Radio Can't Save Sinners"

PARIS.—Sermons broadcast by Radio can never convert sinners, Cardinal Dubois, Archbishop of Paris, believes. The Cardinal is himself a Radio enthusiast.

SAYS RADIO MAKES "SCATTER-BRAINS"

CLEVELAND.—Radio, moving pictures, modern newspapers and automobiles have made the American people a scatter-brained race, James M. Beck, United States solicitor general, declared recently in an address here. The multiplication of mechanical facilities has substituted love of power for things of eternal moment, he said. He urged the preaching of love of work as the best possible cure.

finally to pay for entire equipment with money sent to the church in appreciation of the services broadcast by WWJ.

Reverend Jerome, in charge of the Radio church van, says he is going to give baseball scores, markets, weather forecasts, solos and selections by the Detroit News orchestra. "This will get the folks interested in what I have to tell them," he says.

Besides the Radio outfit, the van is equipped for church services, communion and baptismal services. It also is the pastor's rolling home while he is travelling about the state.

MORE VALUABLE OF PARTS REQUESTED

RETURNS INDICATE THAT POPULARITY GROWS

Many Fans Saving Up Coupons to Get Several Prizes—Sixth Coupon of Series Appears

SPECIAL REWARD OFFER Coupon Number 6. This Special Reward Coupon appears each issue in Radio Digest until further notice. When sent in, accompanied by necessary remittance, according to the rules governing same, apparatus can be secured. See apparatus list and rules of offer below. Save Me—I Am Valuable

Each week the number of Radiophans who are sending in the valuable Special Reward Coupons is increasing and it tends to show that a great number of our readers are anxious to secure the more valuable articles listed. As we stated before, the number of coupons that any one Radiophan may send in is unlimited, the only stipulation being that they must be consecutively numbered and accompanied with the necessary amount of cash, as required for the articles.

This method of obtaining such a varied number of valuable standard Radio parts and accessories is so simple that the plan is gaining new converts every day, as is indicated by the number of letters pouring into the office of the Radio Digest. Do not fail to secure your copy of the Digest each week and clip the coupon so that they may be consecutively numbered in order to obtain the more valuable of the many parts and accessories that are offered for selection.

Rules to Remember

One point must be emphasized to those contemplating taking advantage of the special offer; that is, that the coupons turned in for any item must be numbered consecutively, as for example, 1, 2, 3, and 4 or 3, 4, 5 and 6. The number of coupons necessary and the cash remittance, of course, depend on the item sought by the reader. There is no limit to the number of series turned in by any one reader.

Another point to remember is that cash, checks and money orders but no postage stamps will be accepted. To make selection more simple the items have been divided into eight classes, each class depending on the number of consecutive coupons and amount of cash remittance necessary. The eight classes of items follow:

Class A Articles

For two consecutively numbered coupons and thirty cents (\$0.30) any one of the following articles will be sent: 1 Carter Imp Jack and Plug; 1 Carter 15-Ohm Resistance Unit; 1 Schindler .00025 mfd. Build-up Mica Condenser; 1 Schindler .0005 mfd. Build-up Mica Condenser; 1 Schindler .001 mfd. Build-Up Mica Condenser; 1 Schindler .002 mfd. Build-Up Mica Condenser; 1 Schindler .0025 mfd. Build-Up Mica Condenser; 1 Martin-Copeland Sta Plug; Walnut Standard Tube Socket; Walnut UV-199 Socket; Ray-O-Vac Dry Battery, 1 1/2 volts; Dubilier Micadons Type 601 (.0001, .00025, .0005, .001, .002, .0025, .003 or .004 mfd.); Premier Grid Condenser (.00025 or .0005 mfd.); Premier Variable Resistance; 1 Carter 25-ohm Resistance Unit; Standard Socket Adapter for Delta Midget Tube.

Class B Articles

For four consecutively numbered coupons and sixty cents (\$0.60) any one of the following articles will be sent: 1 Carter .04 mfd. Special Fixed Condenser; 1 Carter Jack Switch; 1 Carter Hold-Tite Jack, One Spring Open Circuit; 1 Carter Hold-Tite Jack, Two Spring Closed Circuit; 1 Carter Hold-Tite Jack, Three Spring Filament Control; 1 Carter Hold-Tite Jack, Four Spring Closed Circuit; 1 Carter Hold-Tite Jack, Five Spring Filament Control; 1 Puddin Variable Grid Leak with .00025 mfd. Condenser; 1 Federal Universal Phone Plug; 1 Federal Open Circuit Jack; 1 Federal Closed Circuit Jack; 1 Federal Double Circuit Jack; 1 Martin-Copeland Shur Grip Plug; 1 Martin-Copeland WD-11 Socket; 1 Martin-Copeland WD-11 Adapter; 1 Martin-Copeland UV-199 Socket; 1 Martin-Copeland UV-199 Adapter 1 Martin-Copeland Pull Switch; 1 Martin-Copeland 5-point Inductance Switch; 1 Martin-Copeland Variable Grid Leak; 1 Martin-Copeland SPST Knife Switch 1 Martin-Copeland SPDT Knife Switch; 1 Martin-Copeland DPST Knife Switch; 1 Martin-Copeland DPDT Knife Switch; Walnut Variable Grid Leak; Walnut Inductance Switch; Electrad Grid Leak (with clip mountings); Dubilier Micadons Type 600 (.0001, .00025, .0005, .001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micadons Type 610 (.001, .002, .0025, .003, .004, or .005 mfd.); Dubilier Micadons Type 601 (.006 mfd.); Dubilier By-Laws Condenser (.1, .25, or 5 mfd.); Premier Universal Tube Socket; Premier Radio Dial (3/16, 1/4, or 5/16 inch black or white face); Premier Universal Radio Jack, Open Circuit; Premier Universal Radio Jack, Two-Circuit Three Spring; Premier Universal Radio Jack, Two-Circuit Four Spring; Premier Universal Radio Jack, Filament Control Three Spring; Premier Switch Lever and 10 Points; Turney Spider Web Coil (SW-20 with .038 milhenry inductance, SW-15 with .066 MH., or SW-20 with .306 MH).

Class C Articles

For six consecutively numbered coupons and ninety cents (\$0.90) any one of the following articles will be sent: 1 Carter 6-Ohm Vernier Control Rheostat; 1 Carter "Tu-Way" Plug; 1 Federal Panel Mount Socket; 1 Federal 6-Ohm Rheostat; 1 Federal 3-Ohm (Power) Rheostat; 1 Amperite Automatic Filament Control (with mounting); 1 Martin-Copeland Marco Rheostat; 1 Martin-Copeland Series Parallel Switch; 1 Martin-Copeland DPDT Panel Switch; 1 Martin-Copeland 7-Point Inductance Switch; 1 Martin-Copeland 9-Point Inductance Switch; 1 Martin-Copeland 11-Point Inductance Switch; Walnut Variable Grid Leak with .00025 mfd. Condenser; Walnut Variable Condenser (3-plate .0006 mfd.); Ray-O-Vac Dry Battery, 2 cells 1 1/2 volts; Dubilier Ducon; Dubilier Micadon Type 600 (.006 mfd.);

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AN EVENING AT HOME WITH THE LISTENER IN (SEE NOTE BELOW FOR INSTRUCTIONS)

Table with columns: Station and City, Met., Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday. Lists broadcast times for various stations like CFCA, CFCN, CKAC, etc.

Instructions for Use.—All the hours above are given in Central Standard Time. If your city uses Eastern Time, add one hour to each of the periods stated; if your city uses Mountain Time, subtract one hour; if your city uses Pacific Time, subtract two hours. If in addition your city is using Daylight Saving Time, add one hour to this result.

CONTENTS

Table listing contents of the issue: All the Live News of Radio, President Harding Speaks to Nation, Hopwood No-Ground Hook-up First Simplex Diagram, This Week's Advance Programs, Radiophone Broadcasting Station Directory, Editorials, First Steps for Beginners in Radio, Flewelling Super with Loop Aerial, How to Make a Camper's Portable Reflex Set, Single Tube Super Good for Portable, Questions and Answers, Radio Illustrated, a Page of Pictures.

Looking Ahead

"Cooperative Competition" in Radio Merchandising—an instructive series of articles telling who owns the patents to the various Radio systems and circuits and how you are pretty well cornered in a giant Radio patent monopoly by certain well-known concerns who have somewhat pooled their interests, written by John B. Brady, a patent attorney of note, will be started in the July 13 issue. Find out why the independent manufacturer has a hard road to travel. Begin reading this informative series next issue.

Radio Frequency Amplification Told Simply—July 13 by Thomas W. Benson in his series for newcomers, "First Steps for Beginners in Radio." Followers of Mr. Benson are unanimous in saying that he misses no detail, no matter how small, in his remarkably clear exposition of Radio principles.

Another Simplex Picture Hook-Up—the second of its kind, will appear next week in the Digest. Turn to Page Six and see the extraordinary method of illustrating circuits that has been started this issue. The uninitiated layman need have no trouble in arranging a hook-up with the assistance of this series.

"How to Make a Camper's Portable Reflex Set"—will be concluded next issue. Details of wiring and the assembly, as well as pictures of the assembled set will be given by H. J. Marx, who will also give operating instructions.

Part Four of the Broadcast Station "Telephone Book"—appears in the next issue. This part will be devoted entirely to the state, city-station index, and is necessary to make best use of the station schedule list.

Have a Copy with You on Your Vacation WHEN YOU WANT Radio Digest YOU WANT IT! BE SURE OF YOUR WEEKLY COPY BY SUBSCRIBING NOW. SEND IN THE BLANK TODAY. Publisher Radio Digest, 123 West Madison St., Chicago, Illinois. Please find enclosed check M. O. for Five Dollars (Six Dollars for One Year's Subscription to Radio Digest, Illustrated.) Name, Address, City, State.

SENDS RADIO MOVIES

(Continued from page 1)

well as hear over the versatile Radio, according to C. Francis Jenkins, of this city. Mr. Jenkins some time ago made successful tests of sending photographs by Radio, as already detailed in a story appearing in Radio Digest some weeks ago. Following the success of this, Mr. Jenkins started work on the sending of the motion pictures.

Last week he showed on a screen in his laboratory, the movements of his hand and other objects held in front of his Radio transmitting apparatus in another room. The apparatus used in transmitting still pictures was employed in the last experiment, but a new "lens-faced prismatic ring" was introduced to show a rapid succession of pictures depicting movement.

Needs Large Corona Glow Lamp. Perfection of the moving picture Radio transmitting set now awaits only the manufacture of a new and more powerful electric lamp of the "corona glow" type. In the recent demonstration a temporary lamp was made by the inventor, but it is not strong enough to transmit large pictures. The question of rapidity is solved, Mr. Jenkins says, as he has already sent pictures at twice the standard movie speed. What he needs is a better and stronger lamp which will stand up when the signal strength is increased about 3,000 times, as is necessary in sending pictures in motion.

Not only actual pictures of moving bodies can be transmitted by pointing the machine at them, but films can be broadcast, Mr. Jenkins claims, and shown on screens in theaters or homes where proper receiving and reproducing apparatus and a screen are available. When the power of the light is raised the size of the picture can be increased, it was explained.

Plans City to City Test

Radio experts of the Navy, who saw the first demonstration between two rooms of Mr. Jenkins' laboratory on Connecticut avenue, say that the invention is adaptable in military operations as well as in commercial fields. They point out that a transmitter used in an airplane over the enemy fleet or trenches would give officers far in the rear an actual view of the fall of shells and all front line activities. In the commercial field, with some adaptations, moving picture distributors might transmit their films to subscribers via Radio instead of by express, saving time and the making of many copies.

With the completion of his new lamp, probably not sooner than several weeks, Mr. Jenkins promises to give a long-distance demonstration, transmitting pictures of objects in motion and perhaps films between Washington and probably Philadelphia.

Doctor Uses Radio to Direct Birth on Isle Gives His Instructions from Distant Life Guard Plant

HALIFAX, N. S.—One of the most impressive accounts of the service rendered by Radio, that of bringing a child into the world when other help was unobtainable, has just been related, for the first time, by Charles Wells, a member of the St. Kilda Life Guard Station on St. Kilda Island off the coast of Nova Scotia. On account of the unprecedented ice-conditions, efforts of the Government ice-breakers to reach the island with doctor and nurse to render aid to Mrs. J. Kartney, wife of one of the members of the life guard staff, failed, so the services of a doctor who had an amateur broadcasting station 150 miles distant was obtained. He had often sent out impromptu concerts which had been received by the members of St. Kilda lighthouse and other receiving centers throughout Nova Scotia.

When informed of Mrs. Kartney's plight he immediately began broadcasting so that the Kilda Isle residents, several of whom had receiving sets, could hear. He gave directions to three women, also living at the lighthouse, repeated the directions several times, and gave all the information necessary. The three women carried out his instructions and the birth was successful. A few days later the doctor who had sent orders by Radio made the trip via a Government ice-breaker and personally attended Mrs. Kartney and found her and an eight-pound baby boy very well.

NEW BROADCASTING STATIONS FOR MEXICO

Government Grants Permission for Erection of Plants

MEXICO CITY. — Two Radiophone broadcasting stations were recently opened here. Various efforts have been made in recent months to obtain concessions for the establishment of such stations, but it is only recently that the government granted this permission. There is great enthusiasm over local broadcasting, and it is believed that the market for Radio sets in Mexico is favorable to considerable development by American manufacturers.

MAN-MADE STORMS "OLD STUFF"—TESLA

SAYS HE MANUFACTURED LIGHTNING FIRST

Inventor Discounts Value of Recent Sensational G. E. Experiment

By F. J. Andrews

BOSTON, MASS.—Much interest was incited in manufactured lightning recently, when engineers of the General Electric Company produced artificial lightning in the laboratories of the General Electric Works at Pittsfield, Mass., but Nikola Tesla, when told of the experiment, said that the manufacture of lightning is nothing new, he himself having succeeded in producing lightning discharges over a hundred feet long twenty-three years ago.

The G. E. engineers constructed a miniature village, including a steeped church, and in the course of the exhibit made the lightning strike the steeple of the church, demolishing it. They also produced rain from manufactured clouds.

"Old Stuff," Says Tesla

"When the average man hears of a manufactured thunderstorm he is naturally dumfounded," Tesla said. "What he doesn't realize is that the village struck by the artificial bolt was only a tiny model, that such experiments are not at all new, and that there is not any prospect of their being of any particular utility. I understand that electrical discharges obtained were fifteen feet long under a pressure of 2,000,000 volts.

"I might also point out that electrical effects such as are here considered grow in intensity with the square of the pressure. Thus the discharges I produced were eighty-one times stronger than those described. I communicated the results to the scientific world at the time and they were widely commented upon."

PHONE WIRES BREAK; AIR COMES TO RESCUE

Radio Proves Superiority Over Lines in Canadian Storm

TORONTO.—Radio communication is destined to play a vitally important part in maintenance of continuity of service on high tension power transmission lines in the future, in the opinion of operating officials of the Toronto Hydro Power Company. This newest form of communication has already been successfully used by the company in quickly locating "trouble" on its lines, and it has proved greatly superior to wire telephone methods used previously.

On a recent report following a severe snowstorm appeared this note: "Bronte—Tower 46, wires number 4 and 6 down—time 2.50 A. M." Beneath the message was the following notation: "Bronte—46—4 and 6 O. K.—time 3.10 A. M."

Behind this prosaic statement is hidden something which is of decided interest to the public and to power companies. When these two wires snapped beneath a weight of snow and accumulated ice, and under the pressure of wind the telephone wires also snapped and communication through that source was eliminated. The operator at the Bronte service station acted quickly and within twenty minutes the service was continued. Wire telephone communication was not re-established until a half hour later.

Beauty Exercises by Radio

COLUMBUS, OHIO.—Physical education by Radio is the latest addition in Columbus broadcasting circles. The flabby, skinny and over or under-developed specimens of humanity, or those who merely wish to take some wholesome exercise, now hear plenty of advice when WPAL of the Superior Radio & Telephone Equipment Company broadcast its lessons in instructive and constructive exercises.

ETHER TAKES HUMAN VOICE TO DEAF MUTE

HONOLULU, T. H.—The sensations of a man, born a deaf mute, who heard a human voice distinctly for the first time by means of Radio, were told by Fred W. Baars, who heard a Radio program recently. Baars is 55 years old. "Always before the night I heard the Radio I had heard only a vague roar," he wrote.

ADD SUMMER SIGNS: HAY FEVER CAUTIONS

WASHINGTON, D. C.—Signs of summer are seen in the recent broadcasts from Station NAA by the public health service on "Hay Fever and Weeds." NAA will not send out band music again until the fall and the bulletins and other broadcasts from the department of labor will not be resumed until December.

PEGGY'S DEBUT AS A RADIOPHAN



Movie fans in general are Radiophans and "Baby Peggy," the well-known little movie vamp, is not to be outdone by her elders, so it seems
Digest Photo

Brazil Firm to Receivers

BUENOS AIRES.—The largest manufacturer of Radio equipment in Argentine has applied for receivership. Its financial difficulties are said to be directly due to intense competition that exists in the Argentine market, which has resulted in considerable price cutting.

Recruit Reserves by Air

CHICAGO.—Recruiting by Radio has recently accomplished marvelous results for the Illinois Naval Reserve. The Zenith-Edgewater Beach hotel station, WJAZ, has broadcast several talks by Capt. E. A. Evers, commandant of the reserve.

AIRPHONE NEW FEAR IN OUTLAW WORLD

LOS ANGELES COPS' AUTOS RADIO-EQUIPPED

Chief Flashes Orders to Motor Squads; "Apprehension of Crooks Now Matter of Minutes"

By Strachan McMillan

LOS ANGELES.—"Beware of the Radio," may soon be the "pass-word" among the outlaws in crookland who desire to escape the net of justice, if the experiments recently conducted by the Los Angeles police department prove to be successful. The Radio will shortly become the bitterest enemy of the criminal and his sure nemesis.

According to members of the police department, if the results of these experiments meet with the approval of the city authorities and the Radio is accepted as a permanent adjunct in the city's criminal-hunting business, crooks and other law-breakers will be apprehended in minutes instead of hours and days after the commission of a crime.

Together with a committee of newspaper men invited by Chief of Police Louis D. Oaks to act as judges of the efficiency of Radio, and with several of the police automobiles equipped with Radio receiving sets, a "crook" in a high-powered car was to be sought by a fleet of department autos each one of the pursuing machines being directed by the voice of Chief Oaks—sitting in his own car, perhaps miles away from the scene of the chase.

How Plan Works

The police automobiles were notified of the crime, were given the number of the bandit car, its direction when last seen, the number of persons in the car, and other bits of information which the central office had at the time.

Chief Oaks stated that "the fine point in the chase" was that he knew where the crime was committed, and that he also knew where his scout cars were stationed at the time. "Suppose that the robbery took place on Tenth street and also suppose that I have Radio-equipped automobiles located at Fiftieth street, First street and at other streets east and west of the point where the crime was committed.

"Then it would be merely a matter of ordering the Fiftieth street auto to head toward Tenth street, the First street car to head out toward Tenth and the other outlying cars to come in, as the circumstances of the particular crime would seem to dictate. The crook in his high-powered car, with his number known and with several other marks of identification at once in the hands of each police automobile, will stand but little chance of getting away."

Kiddies' Story Teller Profits by Broadcasts

"Lamplight Tales" of Caroline Bouve, Proven Feature

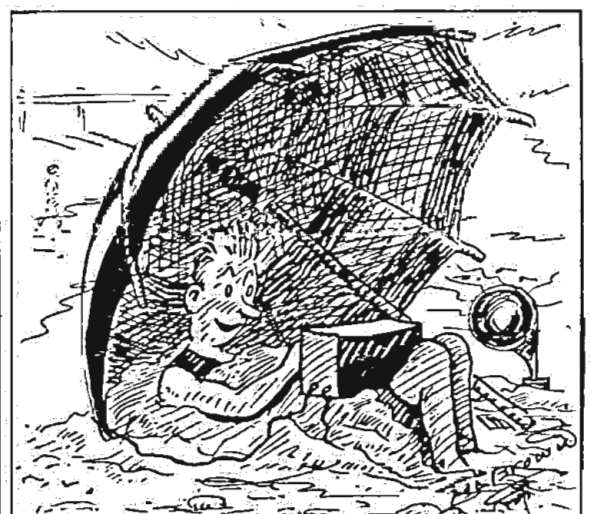
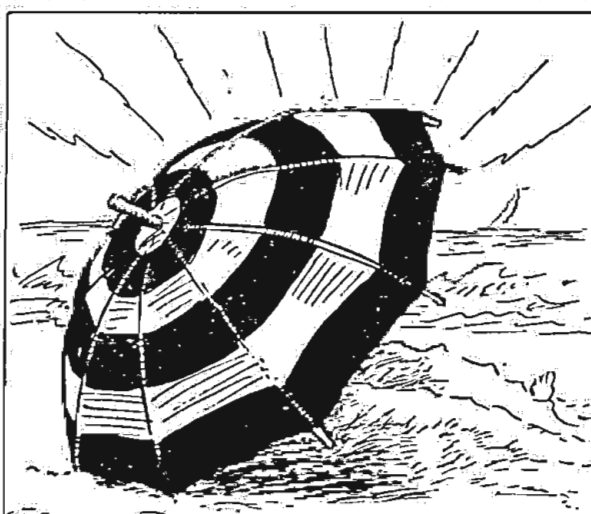
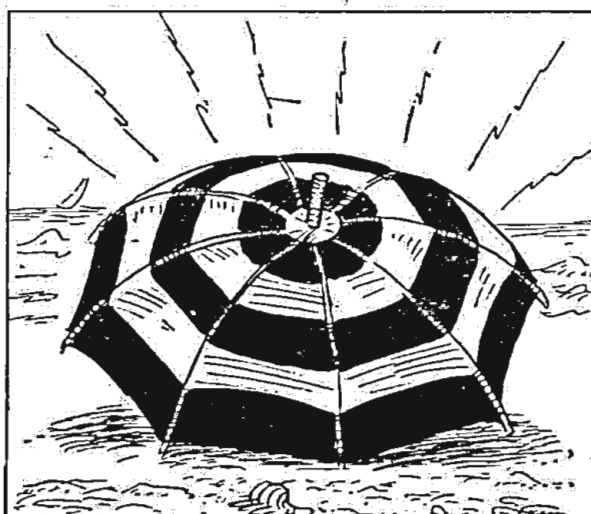
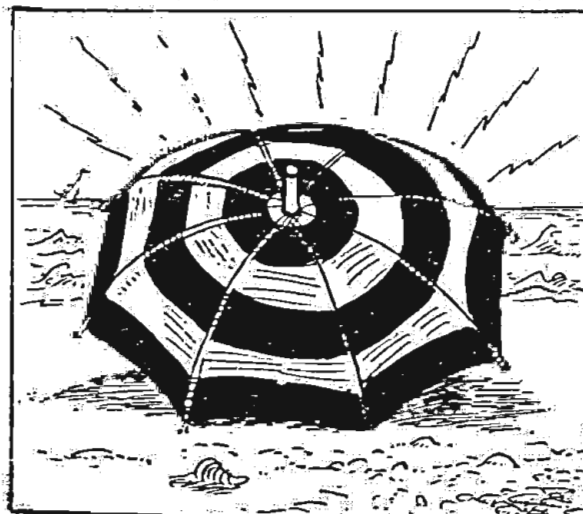
BOSTON, MASS.—At least one author is strong for the Radiophone. This is Miss Caroline Bouve, author of "Lamplight Tales," who says that the bedtime story telling from WNAC by Mrs. Stewart, who was the first to introduce "Lamplight Tales" to the Radio public, have heavily increased the sales of Miss Bouve's book in and around Boston. Miss Bouve recently paid a personal call at WNAC to meet Mrs. Stewart and thank her for her splendid rendition of the stories. The Children's Half-hour, three times a week, proves a big attraction to thousands of children throughout New England, who are privileged to listen in.

The British war office reports the loss of seven secret Radio codes, and an entirely new set of codes is now in process of drafting.

THE ANTENNA BROTHERS

Spir L. and Lew P.

Shades of Hertzian Waves



COUNTRY TUNES IN HARDING'S MESSAGE

ALL STATIONS STAND BY AS PRESIDENT SPEAKS

Event Is of Historical Record—First Time U. S. President Addresses Entire Country

By F. J. Andrews
ST. LOUIS, MO.—On Thursday night, June 21, the chief executive of our country, President Harding, broadcast a speech from station KSD, St. Louis. His speech, the first one of a series which he is giving during his trip to Alaska, was delivered at the international convention of Rotary clubs and was relayed from the convention hall to the broadcast station. The wave length used was 546 meters.

As a special courtesy to the President, all Radio stations in the United States stood by while the President was speaking.

It is quite probable that no one person has ever addressed so vast an audience by word of mouth at one time as did the nation's chief executive on this occasion. Historical importance of the event was enhanced by the fact that it was the first time a President of the United States has made use of the Radiophone to speak to the citizens of the nation on a great political question.

Microphones, coupled to a special loud speaker, picked up the sound-waves and transferred them by wire to the broadcasting station, where they launched into the ether in the usual manner.

MAE MARSH TELLS OF HER MOVIE WORK

Received Munificent Pay of Three Dollars Per Day to Start

NEWARK, N. J.—Mae Marsh, pretty and demure, recently sat down in front of the microphone at WOR here, and in a hesitating sort of way, not frightened or nervous, told the multitude of "listeners in" some interesting things about her work. The main theme of her talk was about David Warwick Griffith, the "daddy" of super-productions, and, of course, she told of her start in pictures.

"In my first picture," Miss Marsh explained, "I received the fabulous salary of three dollars a day. In my second I was paid five dollars a day, and in my third, for some unknown reason, it dropped back to three." (This, of course, brought on a laugh.)

Holland-East Indies by Radio

WASHINGTON, D. C.—Radio Service between Holland and the Dutch East Indies is now in operation, according to a report just received from the American Commercial Attache at The Hague. For the present the service is restricted.

On account of the unusual growth of Radio traffic to Europe, the cable companies have postponed the construction of the proposed new cable between this country and Germany.

CARTER AUTOMATIC RHEOSTAT

THE LATEST THE BEST
Eliminates first and second stage jacks. Decidedly simplifies amplification. Clock-spring pligtail connection insures consistently reliable operation.
No. 3, 6-ohm, for UV-200 tube.....\$2.25 each
No. 3-C, 20-ohm, for UV-201 tube.....\$2.50 each
No. 3-D, 30-ohm, for UV-199 tube.....\$2.50 each
Write for Bulletin on Distinctive Carter Products. Carter Radio Co., 209 S. State St., Chicago.

Minister Heads Big Bible Study Class from Dallas Journal's Plant

Rev. William M. Anderson Tells Story of Origin of Feature at WFAA—Members Listen in with Scriptures in Hand—Letters Proclaim Approval

By Rev. Wm. M. Anderson, D. D.
Much interest has been raised among the members and friends of the Bible Class which is conducted over the broadcasting station of the Dallas News and Dallas Journal by the stories of other classes and other stations, and a bit of pleasant rivalry has come up as to the claims of priority in organization. These things and the desire to pass on a successful part of the work of Radio Bible teaching have brought about the request that the writer of these lines tell the story of the WFAA Radio Bible Class.

The writer is pastor of the First Presbyterian Church of Dallas, one of the larger downtown churches, and, like pastors of similar churches in many places, was interested in the possibilities of broadcasting the church services for some who might not be able to attend.

Asked to Conduct WFAA Chapel
It was in making the investigation of the possibilities of this service that he was taken courteously into the plans of the management of the Dallas News and asked if he would undertake to conduct the chapel on the first Sunday afternoon of the operation of the then contemplated station of the News and Journal. Quickly, although with some fear and trembling, he agreed.

It was then made known that the next day, Friday, June 23, 1922, would be the first test day; that Saturday following would be also for testing and that Sunday would wind up the testing ready for official opening, June 26, 1922. The writer did not fully understand, but presently found out that part of the testing would be of his moral courage and nerve force as he faced the untried ordeal of speaking into a little microphone to an unseen audience of unknown number and sympathy.

Begins with "Microphone Fright"
The experience will be doubtless in agreement with many who tried for the first time to broadcast. Approaching the hour of that first chapel service was enduring agony. There was little sleep Saturday night. There was less comfort Sunday morning. As the hour of 2:30 approached the chapel speaker was barely in possession of the strength to talk.

With much floundering and great effort the talk was delivered to the air. The talker was as much in the air as the talk. But finally both came down. Fortunately the talk came down into receiving sets that were friendly and the speaker had an equally happy fate. That was the beginning of the writer's experience with broadcasting.

Consecutive Bible Study Started
In about six weeks a suggestion was made by L. B. Henson, supervisor of the

station, that consecutive Bible Study would be more valuable to many listeners than unconnected addresses. Consecutive Bible studies were begun. That means that the class undertook the study of the Epistle to the Ephesians verse by verse and section following section. Members of the class were asked to have their Bibles at hand and follow in the scripture the reading and explanation of the passage.

A flood of letters proclaimed the approval of the listeners. For several months, until December 10 in fact, the number of listeners increased with the natural growth of interest in Radio generally, and many letters gave evidence of their presence in the Sunday afternoon audience.

Enrolls Radio Bible Class
Then came December 17 of last year, 1922. For the Bible Class it is an important date. It was this date that announcement was made to the listeners in that the station personnel and the teacher of the class had made a plan to enroll the names of all who would write in a request for the enrollment and have what was believed to be the first enrolled Radio Bible Class. Adams Calhoun, the clear voice of WFAA, gave out the word of announcement. Immediately, by telephone and telegraph, came in the names and the WFAA Radio Bible Class was in existence.

To the best of our knowledge, this marked the first organized Bible Class taught by Radio anywhere. It would be interesting to know from any readers if they have information of any earlier and similarly organized class. Many stations had taught Sunday School lessons, and had chapel, and broadcast services before that date, but we have no knowledge of any earlier organization.

Pass 3,000 Mark
It was predicted that the enrollment

might eventually go to 3,000 or maybe five, and that we might have 2,000 in the first thirty days. The names poured in. An effort was made at first to read broadcast the names. One week 631 names came in. It was a hopeless task to read them all. We had no time left for announcements even—none for teaching. The reading had to be abandoned. Still the names for enrollment came in. Today, as these words are written, we are past the 3,000 mark, and still enrolling.

To each member of the class is sent out a certificate handsomely printed, declaring that the person named on its face is an enrolled member of the class. The certificate bears the teacher's signature.

Letters from invalids, shut-ins, and others who cannot get out to services show the interest of many of these in the growth and work of the class. The orphans' homes of several nearby towns have receiving sets and belong. Altogether the possibilities of its usefulness and reach pass the limits of imagination.

Aviation Talks to Be Broadcast

DAYTON, OHIO.—Plans for establishing a Radio broadcasting station are being made at McCook field. The proposed station will serve as a means of broadcasting lectures on aeronautics from the field in addition to military use. It is expected that equipment, which has arrived at the field, will be set up in time to begin broadcasting by early fall.

Book of Hookups

For One Dollar

Reinartz Flewelling Reflex

many others, simple and elaborate, fully diagrammed and explained. Used continuously by thousands of Radio fans, both amateurs and professionals. The greatest book ever published for experimenting. Keep this valuable little book before you at all times. Send your check or money-order for one dollar and the book will be mailed to you. Forty-seven hook-ups, all different. Send your order today. The edition is limited.

Book of Hook-ups, \$1.00

E L S RADIO COMPANY
Randolph Building
CHICAGO, ILL.
Special Offer to Dealers

WE REPAIR WD-11, \$3.50 and OTHER VACUUM TUBES


Excepting VT-I and VT-II

MAIL ORDERS Solicited and Promptly Attended To

H & H RADIO CO.

516 Clinton Avenue NEWARK, N. J.

a Chi-Rad Special!



for W.D. 11 tubes—

Standard, threaded rubber, Willard's specially adapted for use with WD-11 Tubes. Supply current at 2 volts to one WD-11 Tube for 210 hours on a single charge. Rechargeable. Brand new, size 4x5 1/2 x 7 inches—Chi-Rad guaranteed.

2-Volt Willard Charged... \$7.50
2-Volt Willard Dry... 6.50

These same Willards can be adapted to deliver 8 volts for pure D. C. for C. W. Transmitters. Better than a generator because no filter is necessary. Much less expensive.

In lots of 40 (320 volts) \$160.00
(Better prices on larger quantity)
Specify dry or charged when ordering.

Chicago Radio Apparatus Co.
415 S. Dearborn St., Chicago, Ill.

New GREBE Broadcast Receiver

has Seven Points of Satisfaction

THESE points will be appreciated by those who have long awaited the coming of the perfect receiver.

ASK YOUR DEALER TODAY!

Licensed under Armstrong U.S. Pat. No. 1,113,149



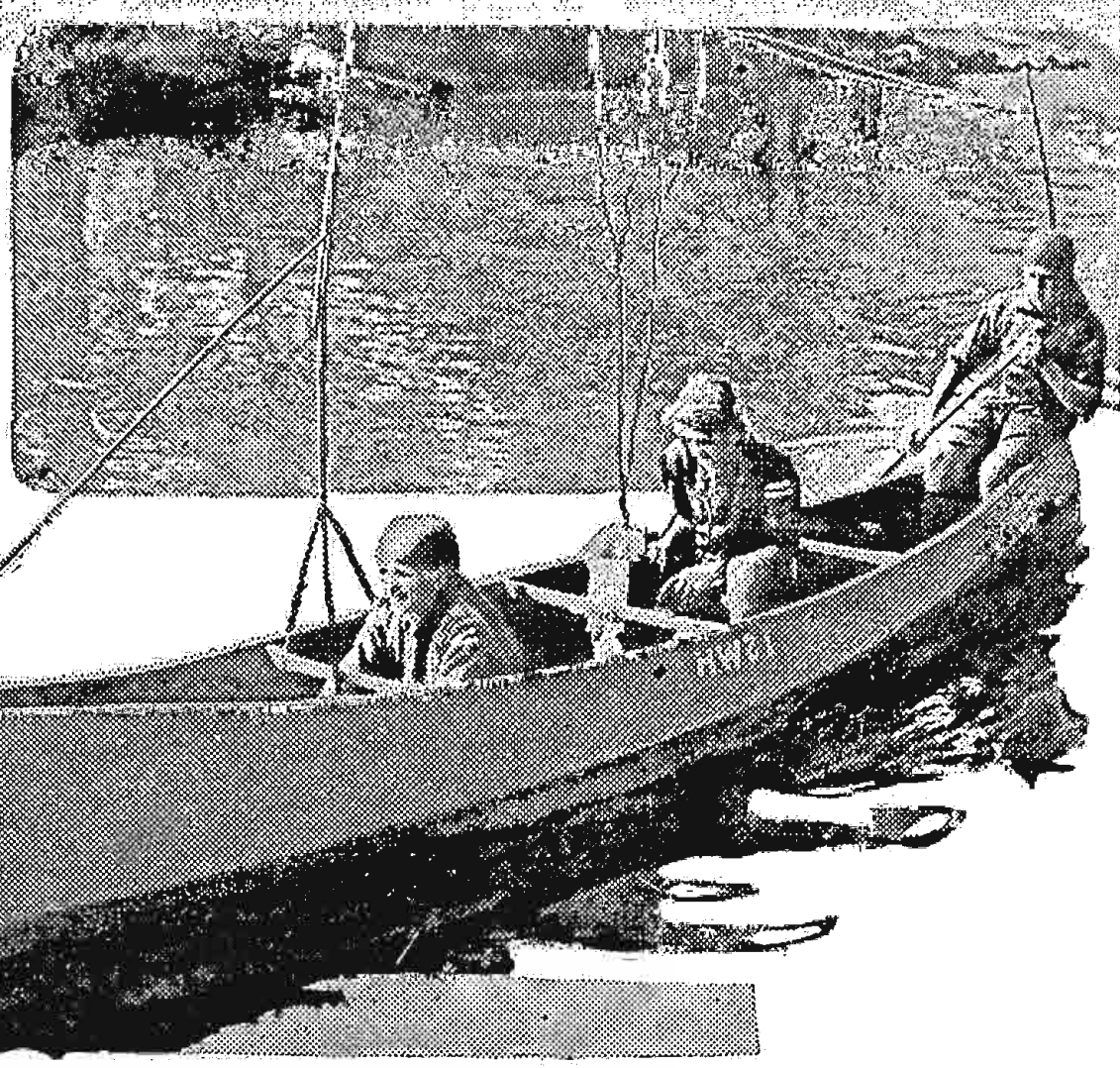
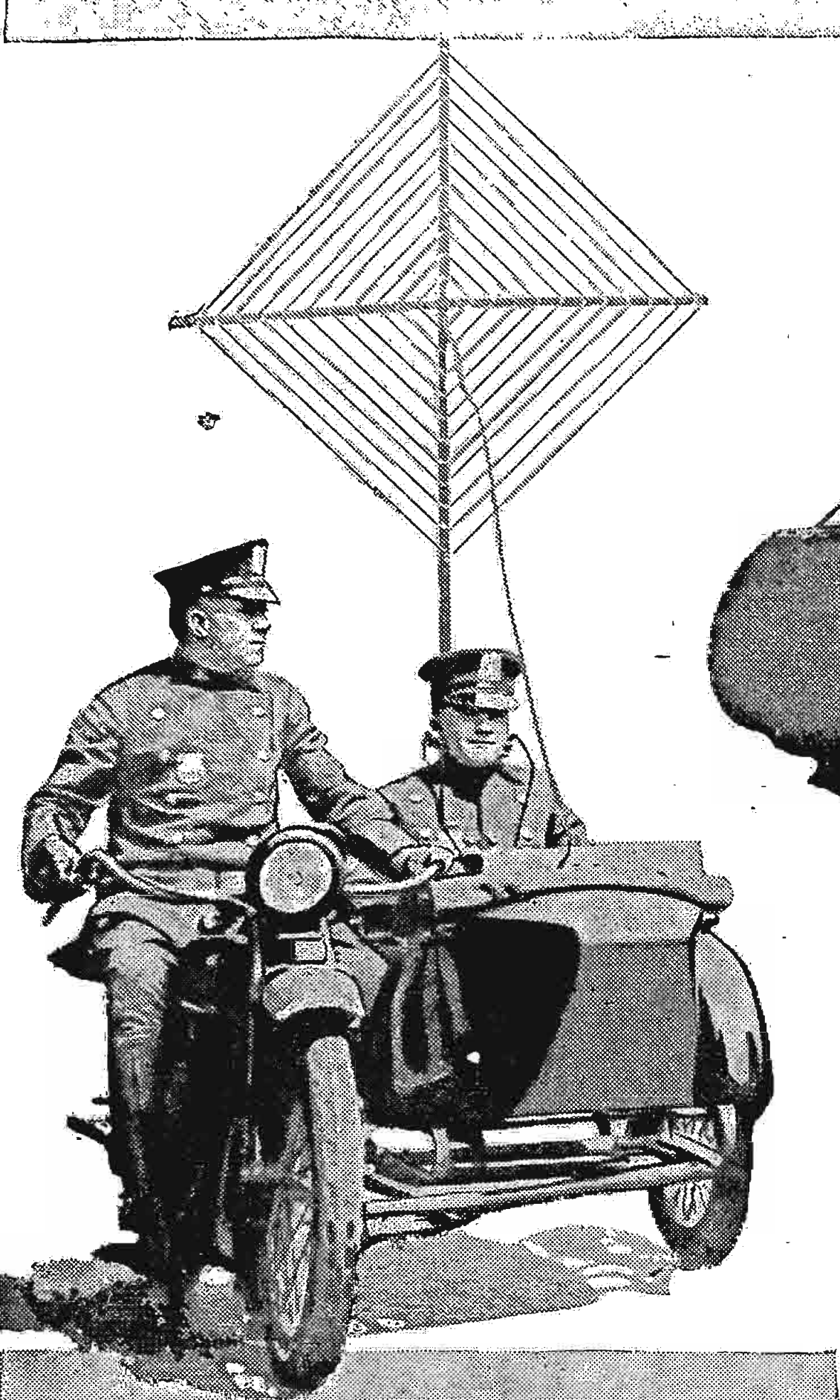

PERFECTION

MAKE PERFECTION YOUR SELECTION

We Carry Only STANDARD Advertised Radio Equipment. Every Product Sold on a MONEY BACK GUARANTEE.

MAGNAVOX LOUD SPEAKER, Type R. 3.... \$24.95	FLEWELLING CIRCUIT Complete parts, including Panel, Double Coil Mounting and 2 Honeycomb Coils. Mounted. ONLY Standard Equipment Used. Free Diagram..... \$13.95
"B" BATTERIES. List Price	REINARTZ CIRCUIT Complete parts for this remarkable set. Free Diagram..... \$11.95
Eversady—No. 763—22 1/2 Volts... \$1.75	WESTERN ELECTRIC Phones. None better made, List \$12.00. Our price..... \$7.95
Eversady—No. 767—45 Volts... 4.50	PANELS—3/16" Thick
Bright Star—No. 15-50—22 1/2 V. 1.75	Hard Rubber Bakelite Hard Rubber Bakelite
Bright Star—No. 15-03-6—22 1/2 V. 2.25	7x18... \$1.85 \$2.45 7x10... \$0.95 \$1.35
Bright Star—No. 30-90—45 Volts. 5.00 3.50	7x21... 1.85 2.75 7x12... 1.25 1.60
Franco—No. 1529V—22 1/2 Volts... 2.50 1.85	7x24... 2.15 3.25 7x14... 1.40 1.95
Franco—No. 3045V—45 Volts... 5.75 3.95	QUEEN'S VARIOCOUPERS OR VARIOMETERS... \$2.50
Nathaniel Baldwin Phones—Genuine	Perfection Radio Corporation, 59 Cortland St., New York City
SINGLES AND CORD..... \$4.50	ADD PARCEL POST—DO NOT SEND STAMPS
DOUBLES, CORD AND BAND..... 8.75	

SCOUTS AND COPS SHOW INGENUITY



Speeding along the highways after criminals or drifting along the languid stream in a canoe, Radio works well in either situation. Above is shown the Radio-equipped canoe of the 1st S. W. Herts Boy Scout Troop. The three members of the troop are sending and receiving messages to and from the scout camp headquarters while drifting down the canal. At the left is one of the new criminal catching motorcycle equipments now in use by the New York City police. Direct contact is maintained with the central office of the department by the novel sidecar arrangement

© News Events

© Keystone

CFCN MOVING 3,500 FEET UP ON MOUNT

PLAN NEW STATION TO BE BEST IN CANADA

Present Quarters Too Small for Equipment—Need More Studio Space for Artists

CALGARY, ALTA.—CFCN, station of W. W. Grant Radio, Ltd., here, will soon be installed permanently in its new headquarters on Mount Royal, one of the outlying suburbs to the southwest of the city, which is many hundred feet above the level of Calgary, as the city is situated in the deep valley of two rivers. The station will be approximately 3500 feet above sea level, and thus will have a higher altitude than almost any station in Canada or the United States.

W. W. Grant has announced his intention of abandoning the present quarters on Crescent Heights owing to the fact that two stations, CFCN and CHBC, The Morning Albertan station, are housed in the same building, with the result that space has become insufficient for the many purposes for which it is needed.

To Be Best in Canada

The new Mount Royal station will have all the conveniences of an ultra-modern broadcasting station. Its broadcasting room, when completed, will be one of the finest, most richly appointed and elaborate in the Dominion.

Considerable difficulty has been encountered in the past owing to the lack of available space in which to accommodate the artists who nightly entertain from CFCN. This obstacle will be completely overcome in the new station.

Moving of equipment will start soon, it is announced.

"RADIO WEST POINT" GRADUATES 65 MEN

Officers Complete 10 Months' Course for Signal Certificates

WASHINGTON.—Gen. George O. Squier, chief signal officer of the Army, presided at the graduation exercises at Camp Alfred Vail, in New Jersey, a few days ago, when sixty-five officers received certificates as signal officers. They all completed a ten months' course in communication work, including Radio in its many phases, and now have been ordered back to their regular duties with cavalry, artillery, infantry and other arms of the service, where they will act as communication specialists.

Quits Shipping Board for R.C.A.

WASHINGTON, D. C.—F. P. Guthrie, chief of the Radio communication activities of the United States Shipping Board, has resigned to accept a position as Washington manager of the R. C. A.

CUNNINGHAM TUBES REPAIRED

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
WD-11 or WD-12.....	3.50
Moorehead Detectors.....	2.75
Moorehead Amplifiers.....	3.00
DV-5 or DV-6A.....	3.00
Also the new UV-189.....	3.50
NEW DX 1/2 VOLT TUBES.....	4.00

All tubes guaranteed to work like new.
Mail Orders Given Prompt Attention
"24 Hour Service"

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

MAKE FANS GUESS OLD SONGS' NAMES

Fans Who Send in Correct Lists of Names Receive Prizes

BOSTON, MASS.—A song contest was recently conducted by the Copley-Plaza Hotel, through the WNAC station, of music broadcast from the Copley-Plaza orchestra. In all the orchestra played 21 old familiar songs, the listeners who sent in the longest list of correct titles receiving prizes of five-pound boxes of candy sent by the hotel management. Miss Janet Hollander, of 70 Columbia Road, Brookline, had the largest list, with eighteen songs correctly named. Some of the songs dated back twenty years.

By request of a Radiophan at sea, sent in by Radio from the steamship Belgian, the Copley-Plaza orchestra played "Angel Face," which was sent out direct from the hotel by WNAC station. This establishes a new record for this enterprising station.

To humanize jail life, a Radio set has been installed in the Allegheny County jail in Pittsburgh, Pa.


SUMMER PHOTOGRAPHS? EARN A DOLLAR—

SUMMERTIME means summer pictures. You and your camera can earn a dollar by sending the Digest out-of-doors photos involving the use of Radio in camp, the automobile, swimming, boating, canoeing, on the lake, playing golf, etc. Send such photographs with negatives and a few descriptive words, including a stamped, addressed envelope so that unsuitable pictures may be returned.

SUMMER PHOTO DEPARTMENT,
Radio Digest,
123 Madison St., Chicago.

Transfer Admiral Ziegemeier

WASHINGTON.—Rear Admiral Henry J. Ziegemeier, director of naval communications, and one of the foremost experts of the navy, has been detailed to command the Norfolk Navy Yard. His successor as director of naval communications has not been named, but it is stated that Commander D. C. Bingham, assistant director, will be acting chief.



Money Earning Opportunity


HERE is your chance to cash in on your spare time. A special offer is being made to you for the summer.

YOU can easily earn some real money, or your choice of Radio parts needed for your receiving set.

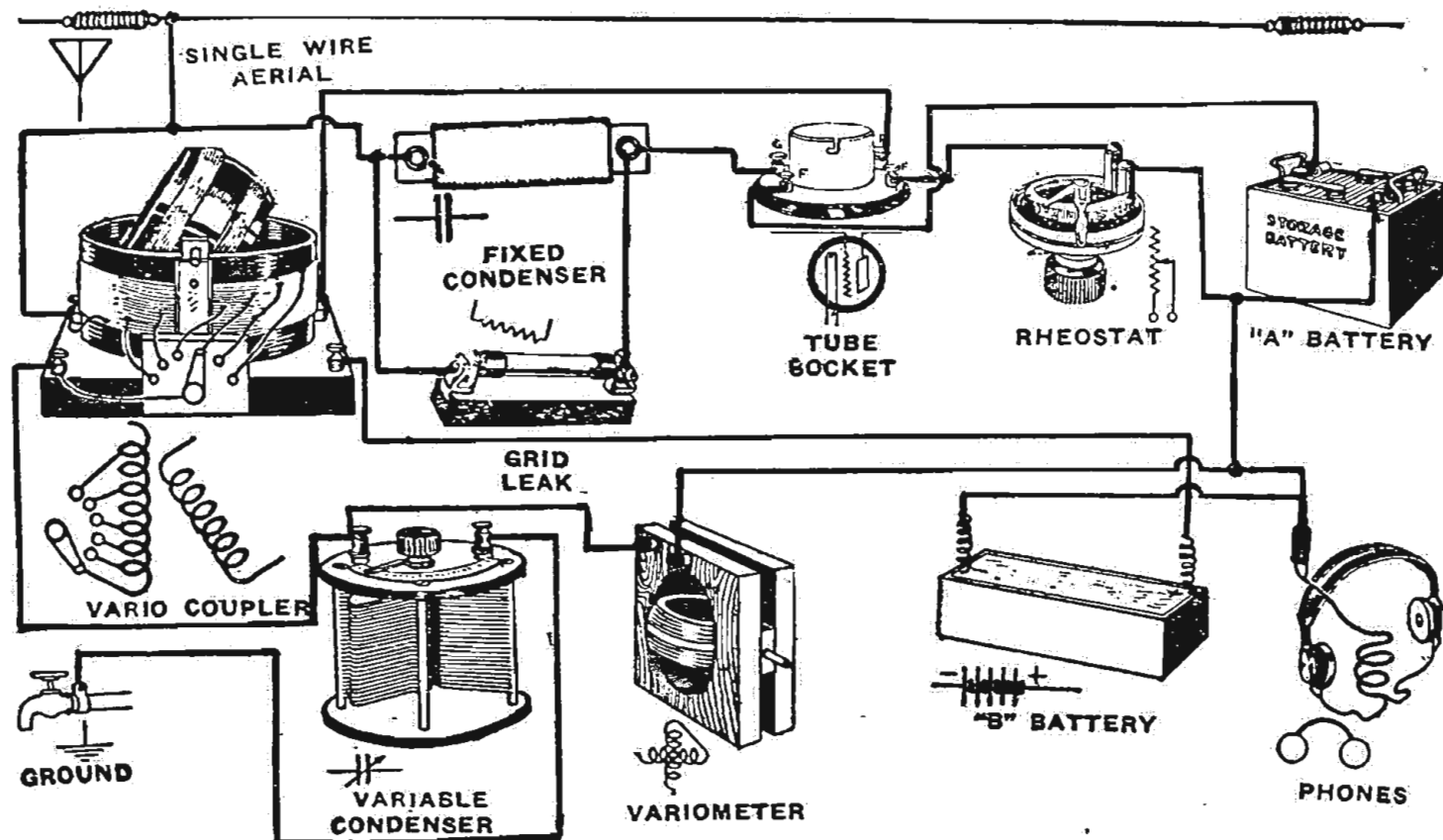
WORK is pleasant and profitable. Just call on your friends, enrolling their names on our large family roll of readers.

WRITE at once for our proposition which is yours for the asking. Address

Circulation Manager, Radio Digest
123 W. Madison St., Chicago



HOPWOOD NO-GROUND HOOK-UP FIRST SIMPLEX



HOPWOOD'S regenerative circuit has been taken as the first to be shown by Radio Digest in the new, simplex diagram series. As will be seen, the diagram symbol, picture and name of each piece of apparatus, is given. The newest comer to the Radio field should not find it hard to set up this hook-up according to the above layout.

The peculiar feature of the Hopwood hook-up is that it sometimes receives very well without using a ground at all. The ground is connected, however, above in the correct location so as to be used if necessary. If used without ground, put the variable condenser in series with the aerial at a point before reaching set. The fixed condenser shown in the grid-aerial lead should have a capacity of .00025 mfd. while the grid leak resistance

across this same condenser should be two megohms. The B battery used has 22½ volts potential, and most any tube, soft preferred, will work well. The variable condenser shown in the ground lead should have .0005 mfd. capacity. While an ordinary rheostat will work satisfactorily to control the filament brilliancy, a vernier type rheostat will aid in tuning in.

Reviews of Books

Radio Experimenter's Hand Book. By M. B. Sleeper. This book will help in the selection and the construction of simple apparatus for transmission and reception of radio telegraph and telephone signals. Price, \$1.00.

Home Radio—How to Make It. By A. Hyatt Verrill. This book is particularly adapted for the amateur who desires to know how to make Radiophones. Twelve full page illustrations and diagrams. Price, 75c.

Elements of Radiotelegraphy. By Elery W. Stone. The text was written for the guidance and instruction of Radio students in the communication service of the Navy. It is an instruction book for Radio schools. Price, \$2.50.

The Armstrong Super-Regenerative Circuit. By George J. Eltz, Jr., E. E. This is a De Luxe edition of this famous circuit. Profusely illustrated and fully explained. Fifty-two pages. Price, \$1.00.

Radio First Aid. Illustrated with working drawings and complete data as to the necessary equipment and cost of constructing from the simplest to the most modern Radio outfits at home. Price, \$1.

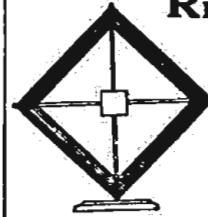
The Radio Amateur's Handbook. By A. Frederick Collins. A new revised edition of this book is just out. It is a complete, authentic and informative work on Radio. Fully illustrated. Price, \$1.50.

The book department of the Radio Digest is prepared to send you any of the books on Radio published, whether listed in our Book Review or not. Let us know what book you want, send us your check and we will see that the book is mailed to you. Postage stamps in payments for books not accepted. Send money order or check. Radio Book Department, Radio Digest Illustrated, 123 W. Madison St., Chicago, Ill.

PATENT ATTORNEYS

PATENTS. Booklet free. Highest references. Best results. WATSON E. COLEMAN, Patent Lawyer, 624 F Street, Washington, D. C.

Ritter Loop Aerial \$1



Including wood parts—wire and binding posts. Can be assembled in a few minutes—Portable, requires little space, 36 inches across. Interference—Static—Lightning practically eliminated. Instructions with every SET. By Mail, 10c Extra. Ritter Radio Company 230 Canal Street, NEW YORK

PARIS COMPOSER SCOUTS RADIO-OPERA RIVALRY

Broadcasts Won't Destroy Interest in Theater

PARIS.—"The Radiophone will no more destroy public interest in the theater or concerts than tinned corned beef will satisfy the gourmet," says Raynaldo Hahn, composer of "Ciboulette," discussing the rapid growth of broadcasting in France during the last few months. From a few hundred instruments last summer it is now estimated there are more than 30,000 receiving sets in the Paris district alone. The Society of Musicians in Paris, however, does not agree with him and is planning a formal protest to the government. Such a renowned musician as Georges de Lausnay, director of the Orchestre de Paris, is planning to collaborate with eight other associations to this end on the grounds that already a diminution is noticeable in attendance at the better class concerts.

"Air Detectives" May Aid Chicago Crime War

Chief Studies Detroit "Land-Water" Radio Patrol

CHICAGO.—This city may soon have Radiophone detectives to combat crookedness in the city's crime war, if suggestions made by Chief of Police Collins are carried out. Chief Collins recently returned from the International Convention of Police Chiefs at Buffalo, N. Y. In a conference with Chief William Rutledge, of Detroit, he learned that the Radiophone is used successfully in that city to combat crime, both on land and water. Many of the police river patrol boats, constantly on the lookout for rum

runners, are equipped with Radiophone receiving and transmitting apparatus.

One of the chief uses to which the "Radio detective" is put to in the Motor City is the broadcasting of the descriptions and license numbers of stolen cars. Also the news of holdups is flung out on the air so that the "strong arms" of the law in the outlying towns can be on the alert for any suspicious cars or persons.

WE REPAIR YOUR VACUUM TUBES

WD-11, WD-12, UV-199, UV-201-A. C-301-A\$3.50 each UV-200, C-300, AP Detectors..... 2.75 each UV-201, C-301, AP Amplifiers..... 3.00 each DV-6, DV-6-A 3.50 each UV-202 4.00 each And Guarantee Them Equal to New QUICK SERVICE Include with your order remittance to cover repair plus parcel postage for one pound per tube. If preferred, tubes will be returned C.O.D., repair charges. Abalene Radio 14 Vesey Street New York, N.Y.

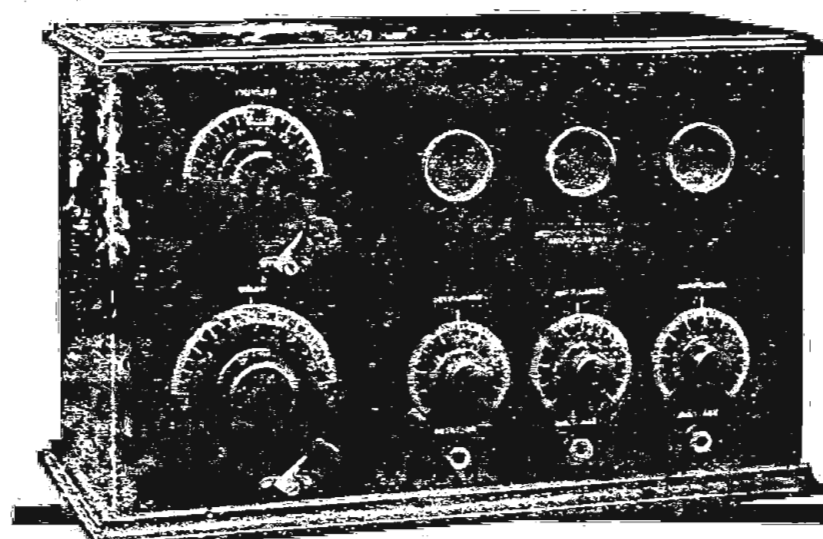
SOMETHING NEW

A real loud talking detector made of "B" metal, 100% superior to any crystal. Puts new life into your set. Guaranteed for one year. It's the cheapest in the long run.



50c

Sold by all live dealers, or can be ordered from the B-Metal Refining Co. 3134 Trumbull Ave. Detroit, Mich.



MICHIGAN "SENIOR" REGENERATIVE RECEIVER

A Large Measure of CERTAINTY and Much Less "Guessing"

Michigan "Senior" and "Junior" Regenerative Receiving Sets, with our patented Split-hair Vernier Dial Adjuster give the operator practically complete control of radio reception.

Our set owners report remarkable success in bringing in any desired station on which they had made previous dial-position records.

Troublesome nearby stations can be tuned out almost at will and signals come in clear, strong, pure-toned.

Loudspeaker reception on the "Senior," or on the "Junior" with our two-stage amplifier, is especially satisfactory.

Michigan Sets are Regenerative, licensed under Armstrong's U. S. Patent No. 1,113,149 and pending Letters Patent 807,388.



Michigan Accessories and Parts include vernier dial adjuster, two-stage amplifier, and a long line of highly perfected variometers, variocouplers, plate condensers, grid condensers, rheostats, etc. Send for our catalog.

The New Grebe Broadcast Receiver



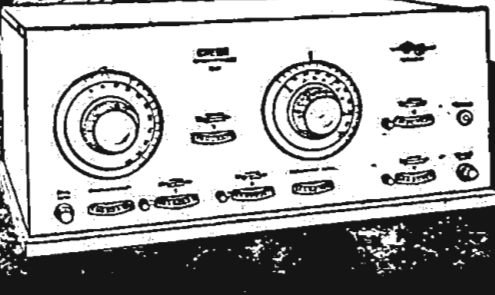
Point No. 1 A SILK-COVERED WIRE but 20 feet long, supplied with this Receiver, does the work of the unsightly outdoor antenna, or loop. This wire may be concealed behind the picture moulding or run along the baseboard.

Just one of its seven points of satisfaction

Licensed under Armstrong U.S. Pat. No. 1,113,149

Ask Your Dealer Today!

A. H. GREBE & CO., Inc. Richmond Hill, N.Y.



MICHIGAN RADIO CORPORATION

GRAND RAPIDS, MICHIGAN

ADVANCE PROGRAMS

(Continued from page 7)

"Tales from the Vienna Woods." Orchestra; Fred Rogers, tenor; "Pomp and Circumstance." Orchestral program. Jenny Lind Wiles, soprano; 2:30-3:30 P. M. Concert. Bouquet's Southland Sereaders Orchestra; 6:45-7:30 P. M., Children's Hour, "Uncle John"; 8:00-10:00 P. M., De Luxe program. KSD (Central, 546), 3:00 P. M., Children's program, pupils of Gibbs School of Music; 8:00 P. M., Musical program, Missouri Theater talent. KYW (Central, Daylight Saving, 345), 8:00-8:58 P. M., Musical program; Cope Harvey's Orchestra; Mrs. Virginia Baxter, soprano; Clyde W. Foster, baritone; Ben Lidovsky, Samuel Starik, violinists; Rose Rosenman, pianist; 9:05-9:25 P. M., "Under the Evening Lamp," Youth's Companion. WBAF (Central, 476), 7:30-7:30 P. M., Sunday School Lesson, Mrs. W. F. Barnum. WFAA (Central, 476), 12:30-1:00 P. M., Address, Prof. Clyde Engleton, Southern Methodist University; 8:30-9:30 P. M., Concert, J. I. Wright's Male Quartet; 11:00-12:00 P. M., Recital, Mrs. Helen Fouts Cahoon, soprano. WGI (Eastern, Daylight Saving, 360), 8:30 P. M., Talk on New England Business Problems, Arthur R. Curlick, Concert. WHAS (Central, 400), 4:00-5:00 P. M., Concert, Mary Anderson Theater Orchestra; 7:30-9:00 P. M., Musical program, Isabelle Wetzlerberger, soprano; King Walker, violinist; Jack Richards, tenor; Beach Williams, saxophonist; Bill Barry, baritone; Hortense Mercer, pianist; Bonny Rosenbaum, banjoist; Ethel Walsh, clog dancer; Reading, "An Interesting Historical Episode." WMAQ (Central, Daylight Saving, 447), 9:15 P. M., Musical program, Mixed Quartet. WMC (Central, 400), 8:30 P. M., Program arranged by Hugh Sandilge. WOC (Central, 484), 3:30 P. M., Educational talk, C. C. Hall, 5:45 P. M., Chime concert; 9:30-10:30 P. M., Dance program, P. S. C. Orchestra. WOR (Eastern, 409), 2:30 P. M., Talk, "First Aid Hints," Dr. Harriet Perkhams; Recital, Lewis Granliss, tenor; Leslie Fairchild, pianist; Lena Kaufman, violinist; "Ballad of Business," M. Bende; Book review, Earl Dana; Madeleine Ores, pianist; Leah Seeley, soprano; 8:00 P. M., Georgia MacFullen, soprano; Lillian May Challen, baritone-contralto; Talk, "The Right Word," J. Curtis Nicholson; Recital, Mr. and Mme. Gracomo Bonig; 10:00 P. M., Concert, Elite Novelty Orchestra. WWJ (Eastern, 517), 3:00 P. M., Concert, Schmemman's Band; 7:30 P. M., Concert, Schmemman's Band.

Sunday, July 8

WFAA (Central, 476), 2:30-3:30 P. M., Bible Class, Dr. William M. Anderson, Jr.; 9:30-10:00 P. M., Sacred music, Central Christian Church; 10:00-11:00 P. M., Concert, Henry Ashley's Kidd Springs Orchestra. WGI (Eastern, Daylight Saving, 360), 4:00 P. M., "Adventure Hour," Youth's Companion Concert; 8:30 P. M., Talk on World Unity, conducted by Mass. Federation of Churches; 9:00 P. M., Music. WGY (Eastern, 380), 9:30 A. M., Church services, First Methodist Church, Schenectady; Sermon, "The Goal of Personality in the Light of Modern Psychology," Rev. Philip L. Frick, D. D.; 7:30 P. M., Church services; Sermon, "My Life," Rev. W. E. Compton, Mt. Pleasant Reformed Church, Schenectady. WHAS (Central, 400), 9:57 A. M., Organ music; 10:00 A. M., Church services, Broadway Baptist Church; Rev. D. Russell Johnson Pirkey, pastor; Mrs. John Rasmussen, soprano; Angeline McCroclin, contralto; Williams L. Vick, tenor; William C. Burger, baritone; 4:00-5:00 P. M., Concert, under auspices of Mrs. Jane Webster Murrell. WHK (Eastern, 360), 8:00 P. M., Musical program, WHK Trio; Little Symphony Orchestra. WMC (Central, 400), 11:00 A. M., Church services, St. Mary's Episcopal Cathedral; 4:00 P. M., Memphis G. Cashville baseball game. WWJ (Eastern, 517), 11:00 A. M., Church services, St. Paul's Episcopal Cathedral; 4:00 P. M., Concert, Schmemman's Band; 5:00 P. M., News Orchestra.

Monday, July 9

WGY (Eastern, 380), 1:00 P. M., Talk, "The New Bias Fold Applique," Modern Priscilla; 7:45 P. M., Musical program; "Rhapsody, No. 9," Kathryn P. Hinkey, pianist; Travelogue address, "A Trip Through India," Part I, Dr. Sigel Roush; "Indian Lament," "Song of India," William Helm, violinist; "A Trip Through India," Part II, Dr. Sigel Roush; "Sparks," "The Winter Wind Etude," Kathryn P. Hinkey; "A Trip Through India," Part III, Dr. Sigel Roush; "Serenata," "Viennese Melody," William Helm, violinist. WHAS (Central, 400), 4:00-5:00 P. M., Concert, Mary Anderson Theater Orchestra. WLW (Eastern, 309), 8:00 P. M., Concert, The Roger Hill Dance Orchestra; 8:30 P. M., Grand Opera from the Cincinnati summer opera season at the Zoo. WMC (Central, 400), 8:30 P. M., Concert, Hotel Gayoso Orchestra.

SPECIAL OFFER LIST

(Continued from page 2)

Dubilier Mleadon Type 610 (.01 or .02 mfd.); Dubilier By-Pass Condenser (1 mfd.), Premier Universal Radio Jack, Filament Control Five Spring; CRL Variable Grid Leak, without condenser; Premier No. 250 Variable Resistance, panel mounting.

Class D Articles

For eight consecutive coupons and one dollar and twenty cents (\$1.20) any one of the following articles will be sent: 1 Carter 20-Ohm Vernier Control Rheostat; 1 Schindler Radio Frequency Transformer; 1 Martin-Copeland 13-Point Inductance Switch; 1 Martin-Copeland 15-Point Inductance Switch; 1 Martin-Copeland 19-Point Inductance Switch; Walnart Variable Condenser (5-Plate .0001 mfd.); Ray-O-Vac No. 4151 B Battery, 2 1/2 volts; Ray-O-Vac Dry Battery, 3 cells 4 1/2 volts; Electrad Variohm, with mica condenser; Dubilier By-Pass Condenser (2 mfd.); CRL Variable Grid Leak with Condenser; Resistorometer (Type A or 2A).

Class E Articles

For ten consecutive numbered coupons and one dollar and fifty cents (\$1.50) any one of the following articles will be sent: 1 Carter 6-Ohm Automatic Control Rheostat; 1 Carter 20 Ohm Automatic Control

POSITIVE RESULTS

are being obtained by thousands of satisfied users of the

EASTERN COIL SETS for Cockaday Circuit

The remarkable features which are making this circuit more popular each day are its simplicity of construction and control—wonderful selectivity—distance recording—clearness and loudness of reception, and the fact that all capacity squealing, interference, etc., are eliminated.

Made as per specifications of Mr. Cockaday, using No. 18 wire with D coil bank-wound. COMPLETE SET OF B, C AND D COILS—PRICE \$2.75

Hook-up, directions and material list furnished free with each set of coils. Mail Orders Filled. Dealers Communicate

EASTERN RADIO MFG. CO. 22 WARREN STREET NEW YORK, N. Y.

FLEWELLING ANSWERS TO QUERIES

By E. T. Flewelling

(Editor's Note.—This department is written by Mr. Flewelling, the inventor of the famous super circuit. From the questions sent him each week care of Radio Digest, he picks the one considered most informative for all and answers it in this column.)

Series Condenser and Tube

(Submitted by F. W. S., Fostoria, Ohio.)

Question.—Have built a Flewelling Super set exactly as per the instructions in Radio Digest except that I am using a 23-plate .0005 mfd. variable condenser instead of the 11-plate .00025 mfd. condenser that you recommended, and am also using a UV-200 tube. Would this make any difference? I tune in nearly all of the stations, but do not hear anything of the whistle that you speak of. Can you tell me what my trouble is?

Answer.—So long as you get all of the various stations you can be sure that you are able to tune your set with the 23-plate condenser, so unless you care for maximum results, you can continue using this one. The reason that an 11-plate condenser is recommended for the Flewelling Super is explained by the following: A vacuum tube when used as a detector gives returns dependent upon the voltage impressed upon the grid of the tube, the rule being that the output is proportional to the square of the input. If we multiply the input voltage by five times, we increase the output of the tube 25 times. Now, the voltage that we impress upon the grid of our detector tube is dependent upon, among other things, the amount of inductance we use in our tuning device. The more inductance and the less capacity, the greater will be the voltage on the grid of our tube. If we can still tune our set to resonance, then the smaller the condenser we use, the better will be the results. That is one reason for the 11-plate con-

denser recommended for the Flewelling Super. When you bring in a station two or three hundred miles away and your set is only connected to the ground, you must realize that you are dealing in mighty small quantities and that you must take advantage of every little factor that might be of help.

Now as to the tube that you are using. The Flewelling Super is undoubtedly the simplest known method of producing super regeneration. It does this in the following manner:

We allow our set to regenerate to the point of "spill over" and block the tube. This stops the action of the set, but our .006 mfd. condenser has now accumulated a charge, our grid leak is so set that it allows the blocking charge to leak off of the grid. As this charge leaks off, the tube and set go into action again, but (and here is the important feature) the .006 mfd. condenser now discharges. This charge and discharge are exactly timed by the grid leak adjustment, therefore giving up the opportunity of letting our tube regenerate to its full capacity and yet restricting from oscillating at its own free will. Ordinarily we are restricted as to the amount of regeneration that we can use, because of this tendency toward free and sustained oscillation.

Were we to use a soft tube such as the UV-200 we could do the same thing, but at a great loss in efficiency and at the expense of a great deal of trouble. We could not block the tube so readily nor could we use high enough plate voltage to give maximum results.

A real good regenerative set plus one .006 mfd. condenser used in conjunction with a hard tube and a good variable grid leak, will enable one to operate what is perhaps the most sensitive Radio receiver known today, the super regenerator.

A. C. Used for Amplifier Tubes

Alternating current may be used to heat the filaments of amplifier tubes, but cannot be used for the filament of the detector as the alternating current hum is so loud that it is impossible to receive the Radio signal. A crystal detector is usually employed to rectify the signal in multi-stage amplifiers which have the filaments of the amplifier tubes heated by alternating current. By using a "hard" tube with the grid and plate elements connected together as a rectifier, and employing a proper filter circuit, the alternating current supply may also be used to provide the necessary plate voltage.

A single coil crystal set will not tune as good as a two circuit one.

Rheostat; 1 Decima 3-Plate Variable Condenser; Walnart Variable Condenser (13-Plate .00025 mfd.); Ray-O-Vac Dry Battery, 4 cells 1 1/2 volts; Dubilier Variodion (.0004 or .0006 mfd.); Resistorometer (Type B); Delta Midge Tube and Socket.

Class F Articles

For twelve consecutive numbered coupons and one dollar and eighty cents (\$1.80) the following will be sent: 1 Acme Pot-Rheo (potentiometer and rheostat); Walnart Variable Condenser (23-Plate .0005 mfd.); Ray-O-Vac No. 2151 B Battery, 2 1/2 volts; Dubilier By-Pass Condenser (3 mfd.); Premier Variable Condenser without dial (.00039 mfd.).

Class G Articles

For fourteen consecutive numbered coupons and two dollars and forty cents (\$2.40) any one of the following articles will be sent: 1 Federal 7-Plate Variable Condenser; 1 Federal 11-Plate Variable Condenser; 1 Federal 21-Plate Variable Condenser; 1 Federal Anti-capacity Switch; 1 Decima Variable Condenser 11-Plate Walnart Variable Condenser (43-Plate .001 mfd.); Dubilier Variodion (.001 mfd.); Dubilier By-Pass Condenser (4 mfd.); Premier Variable Condenser with dial (.00078 mfd.); Premier Hegehog A. F. Transformer, 4 to 2 Ratio.

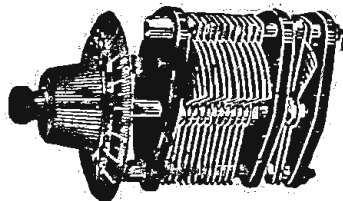
Class H Articles

For sixteen consecutive numbered coupons and three dollars (\$3.00) any one of the following articles will be sent: 1 Federal Audio Frequency Transformer No. 228 W; 1 Decima 23-Plate Variable Condenser; 1 Acme Audio Frequency Transformer; 1 Acme Radio Frequency Transformer (R-2, R-3, or R-4); Walnart Variable Condenser (13-Plate vernier); Walnart Variable Condenser (23-Plate vernier); Ray-O-Vac No. 2301 "B" Battery 45 volts; Ray-O-Vac Dry Battery, 6 cells 1 1/2 volts; Dubilier Duratran (R. F. transformer); Premier Micrometer Variocoupler with dial; Premier Variable Condenser with dial (.0015 mfd.); Premier Variable Condenser with vernier (.0004 mfd.); Premier Hegehog A. F. Transformer, 10 to 1 Ratio; Premier Hegehog A. F. Transformer, Tube Socket Type, 4 to 1 Ratio; Turney Spider Web Coil Mount, Type B.

Reflex Amplifier

A "reflex amplifier" using three tubes, a crystal detector and associated apparatus, may be so connected as to provide three stages of Radio frequency amplification, detection and two stages of audio frequency amplification. The tubes thus operate both as Radio and audio frequency amplifiers, but it is not advisable to attempt the use of more than two stages of audio frequency amplifications, due to the fact that the highly magnified audio frequency signal prevents the tubes from operating efficiently as Radio frequency amplifiers.

For Perfect Reception You Must Use



AMSCO Vernier Condensers

They satisfy the most exacting. Perfect spacing, permanent adjustment—finished in white nickel.

- 13 plate\$5.50
23 plate 6.00
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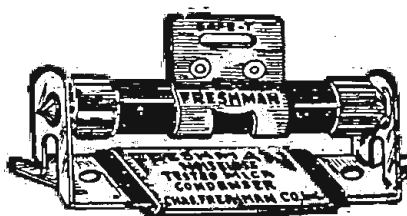
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Chas. Freshman Co. Inc. Radio Condenser Products 106 SEVENTH AVE., NEW YORK

The Reader's View

Single Circuit Selectivity

What's all this twaddle about single circuit receivers not being selective? I say "twaddle" because that's just what it is.

There are several amateurs in this town who use the phone a lot and they never interfere with my reception of broadcasting. Canadian 3AEO, using four tubes, is only three blocks away, never bothers me at all. I have heard him talking to 3KO, ten blocks away and then tuned in WWJ or WVGJ and haven't heard a peep out of 3AEO or 3KO. They were still going for I turned back to see if they were still there and they were very much so. I could hear them all over the room on two tubes when I had either one tuned in.

I have had 3AEO speaking to me and giving me a message and 3KO, a 10-watter, come on calling 3IR. I could hear 3KO faintly but being tuned to 3AEO, I heard every word of his message with no difficulty. 3KO works on 190 meters and 3AEO works on 200 meters.

My set isn't a freak for I have built four just like it and they all work equally as well. I have made them all get KHJ or KFI as a final long range test before I pronounced them O. K. Los Angeles is about 2,200 miles away from here.

I have heard several two circuit sets around here and have gone away disgusted and feeling glad that I owned a single circuit receiver.

I think it's about time somebody started out with an axe after the guys who spout the piffle about a single circuit set not being as selective as a two circuit set.

Your issue of May 5, 1923, contains an article on editorial page of this nature. In view of my own observations and tests I cannot help but think that such an article is everlasting piffle. I maintain that selectivity is more easily obtainable in a single circuit than in a two circuit set for the reason that very few owners of two circuit sets know how to handle them, even after months of monkeying with them.—Cliff H. Dafeo, Chatham, Canada.

Single Wire Antenna

A receiving antenna adapted to wave length of 360 to 400 meters should be a single wire installed in the shape of an inverted L, the total from the distant end to the receiving set being between 160 and 180 feet. Both ends of the horizontal portion should be supported as high as possible, at right angles to power or telephone lines and above tin roofs or grounded metallic structures.

RADIO VIA PARCEL POST AT N. Y. PRICES

Standard Parts Only, in Original Packing NO SALVAGED GOODS SOLD Where "Money Back Policy Prevails"

Table listing various radio parts and their prices. Includes sections for PHONES, COUPLERS, VARIOMETERS, VARIABLE CONDENSERS, TRANSFORMERS (Audio Frequency), TRANSFORMERS (Radio Frequency), MISCELLANEOUS, and SETS.

Modelts ESTABLISHED 1912 191 Fulton St., Dept. F-19, New York City 9 New York Stores America's Greatest Radio Mail Order House

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Published by the Radio Digest Publishing Company, Inc.
123 West Madison Street
Telephone State 4844-4845
Chicago, Illinois

E. C. RAYNER, Publisher

Clas. F. Smisor, Editor Evans E. Plummer, Managing Editor
Harry J. Marx, Technical Editor

Eastern Representative, Jacob Miller, Times Bldg., Times Square,
New York; Telephone Bryant 4909

Pacific Coast Representatives

E. J. Wood, 251 Kearney St., San Francisco
Telephone Kearney 1472

H. M. Morris, 417 Western Mutual Life Building, Los Angeles
Telephone 12011

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PUBLISHED WEEKLY

SUBSCRIPTION RATES

Yearly.....\$5.00 Foreign.....\$6.00
Single Copies, 10 Cents

Vol. V Chicago, Saturday, July 7, 1923 No. 13

Summer Teaches Us Lessons

Many Things to Be Learned for General Improvement
THE little setbacks that Radio may receive this season will be a boon to the entire industry. The dealers and manufacturers will have time to learn the needed lesson. The time has come when a dealer cannot afford to carry a conglomerate stock of odds and ends, expecting to unload it at a great profit on the public. The time has passed when a newly born fan will step into a store and buy anything with a piece of wire wrapped around it. The spasmodic demand of the faddists will not prove profitable in the long run. The dealer is beginning to realize that dependable apparatus, bought to meet the varying Radio conditions, is more to be relied upon than unknown apparatus that looks good in the catalogue and is merely an ornament on the shelves.

Radio Intelligence Work

Invaluable Assistance in Army Maneuvers

ALTHOUGH little was known of the work of the Radio intelligence section of the army during or since the war, it was one of the most spectacular. Radio direction finders were placed all along the lines at a distance of about five miles from the actual front and spaced about twelve miles apart. These receiving sets located the enemy stations in operation, recorded their bearings by means of directional coils, not unlike modern Radio compasses, and forwarded the bearings to headquarters, where they were plotted on maps. Other Radio receiving stations at army headquarters intercepted and copied all enemy code messages and telegraphed them back to general headquarters, where code experts worked them out, giving the staff valuable information as to the movements or intentions of the enemy.

Humidity Makes Trouble

Dampness Will Make Set Inoperative

YOU will find that a great many ills with the Radio set are laid at the door of static, but a large portion of them can be found in dampness. The summer season is attended with damp spells which fills the air with humidity. The outside weather conditions are let into the house, for windows are allowed to be left open most of the time. Sets are taken to the seaside and on boating trips where dampness prevails.

Under such conditions the broadcast listener is apt to wonder why that set which has acted so faithfully at home in a warm room has suddenly become languid. Dampness in most cases is the secret of the jinx that is resting on the wonder box.

Water is one of the highest conducting substances of electrical energy, and dampness indicates the presence of water. Sets in which the base and panel mountings are not damp-proof are not going to be efficient in damp weather. Leakage that to the lay mind may mean nothing will appall the Radio engineer who is able to comprehend what this means.

Real Pleasure in Making Sets

Homemade Sets Outnumber Manufactured Ones

A NUMBER of years ago, before Radio had the universal appeal that it has at the present time, it was necessary for the experimenter, or man who was interested in the science, to make practically all of the parts that went into his set, but the present tendency seems to be to go to some store and buy these parts already built. This means that the cost of the sets are higher, and a great deal of the real pleasure is left out of the operation of building your own set. Incidentally, a great deal of this apparatus is not as good as the real homemade parts. However, there are some parts, such as head phones, vacuum tubes and transformers, that are much better manufactured where duplication of the finer details may be procured.

The average fan takes much pride in making parts, and there is a great deal of satisfaction taken when those parts function correctly and bring in messages. Careful construction always brings results, and many times a homemade set will surpass those of special manufacture.

RADIO INDI-GEST

In Quest of the Kanoofis

Part IV—The Arrival at Walla Walla

After thirteen years of sailing upon the ocean blue. (Bloo-ee.) A little island in the sea came popping into view. (Pop-pop.) We landed on the shore at night, because we thought it best. (Fraid cats.) And there were all the contribs to Radio Indi-gest. (Playing hop scotch.) They greeted us with open arms and asked us where and how. (Wherfor.) They did not recognize us, for we are old men now. (We looked like Santa Claus.) The Spaniards that we took from Spain, all spoke good English too. (We taught them how.) They were all Radiophans, you see, and stuck to us like glue. (Major's cement.) It seems Indi-gest bought this place for reasons of his own. (Real estate.) And put a station on it that throughout the world is known. (This is Station B-U-N-K broadcasting.) A laboratory he has, too. Now there's some common sense. (Horse sense.) From here he broadcasts funny things, and does experiments. (Gives big prizes, too.) We told him of our searching for years to get one part. (We looked, too.)



So he said, "WALLA WALLA'S where you should have made your start. (What did we know?) We have a real Kanoofis here. It's buried in the ground." (So, you've been hiding it?) He scraped the earth a little bit, and that was what he found. (May have some lickier buried, too.) Now, we suppose you're right on edge to know what it can be. (You are, too, aren't you?) A Kanoofis is the funniest thing that ever you did see. (Never was in a circus, either.) "It's a SILK THREAD off the corner of a dark red TURKISH TOWEL. (Aw, I knew it all the time.) You hang it on your switch points, so your Radio set don't howl. (Certainly glad that's over with.) —ENDED BY JENNIE JEROME. (Readers desiring Kanoofises may secure same from Mr. Indi-Gest by tendering suitable contributions, or what have you?)

(1) Sure; (2) The Natives Stole 'Em for Beads

Dear Indi: By the looks of the flashlight photo of your new station you have already joined the A. R. R. L. (Sure, I'll bite. Why?) Because, note the moonshine and how still it looks. Am I right? I also note the insulators are conspicuous by their absence. Whyfor? —MIKE ROFARADS.

A-B-C Lessons for Indigest Beginners Chapter III—Have You a Little Crystal?

BY GOSH

C IS for crystal,
A chuck of stuff quite neat,
That brings in all the locals
Quite clear and very sweet.

Revenue Officers Say You Can't Work Your Circuit

Gents: Well, the great problem is solved at last. The illicit liquor which is being broadcast by the A. R. R. L. can now be received. The answer is in the Undiluted Still Condenser Circuit. A copy of this circuit is enclosed. The 20 gallon tube is mounted with the water-cooled plate at the lower end. The faucet is mounted at the lower end of the plate so that the ether which gathers in the tube through the process of Volsteadization may be drawn out. The phones should be worn during the reception and one will hear the sweet strains of "How dry I am." —HOOTCH SHOT DICK OF BLAND CANYON, COLO.

Rest in peace
Charles Daniel McCluer.
He tried to murder
A "spark" amateur.

Referred to the P. and Q. Dept.

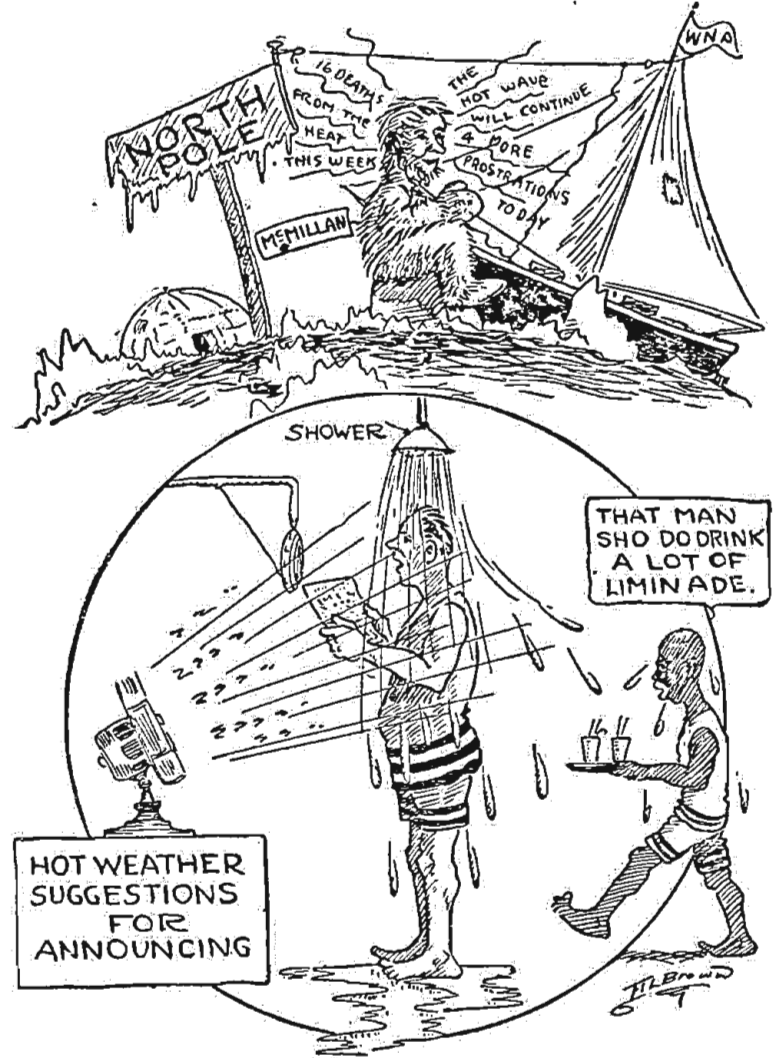
Dear cir? I have saw your unvaluable paper and wood like to get sum inflammation how to bild a set. Wear dos the varyomeet her go? How meny bees do you use in a bee battery? Do you keep the bees in a honie combe coil? I have not got a aunt enna, I have a aunt Mary & she is only five feat long. Do you roast a peanut tooobe? Wil I kneed a potatoe meter? Yours in variable.
FEEDBACK FOG.

We Passed It on a Blind Man

Dear Indi: I notice your kinks department and since I have a dollar no one will accept I am sending it with the kink. An amateur told me that a wrecktifier is necessary to charge my storage battery from A.C. current. Having a small baby sister who wrecktifies the tubes in 1.45 seconds flat (world's record) I decided to use her to advantage. Following is the circuit:
Put baby in the box and in few moments she will wrecktify the lamps. Then take disconnected battery and carry to battery station. The best feature of this wrecktifier is the exercise you get carrying the battery. Yours cruelly.
—I. T. SMEE.

Looking Ahead

You Can Never Tell What's Wrong with a broadcasting station program till you hear from its listeners. If you were one of the lucky Radiophans to hear Indigest's opening night program, don't let us hear from you, unless you have a kick. We always like a good kick in anything. Send along the kicks-as Walla Walla has a complete repertoire of non-trust songs and, oh, boy! What a CHARMING flock of sopranos. Now, these sopranos are very versatile and strive to please. Bambdin Bray is training them that way. If you don't hear what you want, ask for it and Bambdin will train 'em. What is your ideal Indigest Program? Read Indigest two weeks from now and maybe somebody will send some in. Buy Indigest from your most horrible newsdealer, 10c. In fact, continue buying Indi until we tell you to stop.



Condensed

By DIELECTRIC

News of the Marine Band concerts from Station NAA being off for the summer months was not received with joy by the thousands who tune in for them, but later advice is very acceptable. With the new station in the national capital on the air these concerts may still be heard. The music will be picked up in the local parks and sent out as usual. WEAJ will relay some of the concerts and speeches, which will ensure many weaker sets the pleasure of listening in too—though far away.

And now photosculpture! There is only one fault with this new marvel in Radio, and that is that two cameras are required for the job. So many folks get to oscillating when they face only one camera, and with two before them they may distort the image entirely. Borah or LaFollette would enjoy the experience probably; although it requires an hour to transmit the impressions from subject to sculptor they would lose nothing in the interim—and we would gain bronze tablets. Would that constitute base-relief?

"Al" Smith is not regarded as exactly bone dry, nor does he believe in treating a dry subject without some admixture of moisture, and I submit the proof of that was given only recently. This genial governor of New York state addressed the people of his state by using Station WGY to report directly on the financial status of the commouwealth. Usually such reports are very dry. This was not, and while the choice of phrases may have had something to do with that, I believe the main factor was receiving sets in comfortable home surroundings.

The General Electric Company plans to have duplicates of its well known Station WGY in sections of the country serving the largest audiences. One of these, as already indicated, is to be completed by fall at Oakland, Cal., and another is likely to be built at Fort Worth, Texas. Each of these stations has a normal radius of well over a thousand miles and Radiophans will look forward to having so good service as they are accustomed to from WGY, in other parts of the country.

Every Radio journal, and section of daily papers covering the subject, is calling attention to the manner of using Radio sets on vacations. We need to be educated to the idea that the pleasure of listening in is there for us this summer as never before. Static, of course, is still on the job as in seasons past, but the powerful stations can cut through it for a considerable distance, also interference has been reduced nearly to the limit. If you fail to include your set on that trip, you will certainly regret it and spoil your outing to a large extent.

There are many who prefer to listen to well-balanced programs of lasting music rather than the evanescent outpouring of a wailing ukelele. To such the "pop" concerts given from Station WNAC in Boston offer real treats. Not only do you hear an orchestra, comprised of members of the Boston Symphony, but it has been possible to listen to the Harvard glee club, a thoroughly trained body of singers.

Radiophans of the country owe much to station WEAJ for their enterprise in boosting along the speeches of President Harding, the one from St. Louis and another from Kansas City. We have been looking forward to the time when it would be possible for the mass of American citizens to hear (if not see) the head of the nation. I do not doubt the ultimate effect of this presidential broadcasting will be to focus larger attention on Radiophony to our general benefit. The next step—already visioned—is to accompany speech carried by ether waves with a moving picture of the speaker right in the home. This would almost entirely eliminate the sense of distance, which has already been materially reduced through the use of Radio.

Flewelling Super with Loop Aerial

Need Make Few Changes to Convert Flivver Set

I have tried out the Flewelling hook-up and found it satisfactory and tried to adapt it to a loop antenna and the results have been more than satisfactory. For

WORKSHOP KINKS? EARN A DOLLAR—

THERE are many little kinks worked out at home that would aid your fellow Radio worker if he only knew about them. There are new hook-ups, new ways of making parts and various unique ways of operating sets that are discovered every day. Radio Digest is very much interested in securing such material. Send them in with full details, including stamped envelope so rejected copy may be returned. The work must be entirely original, not copied.

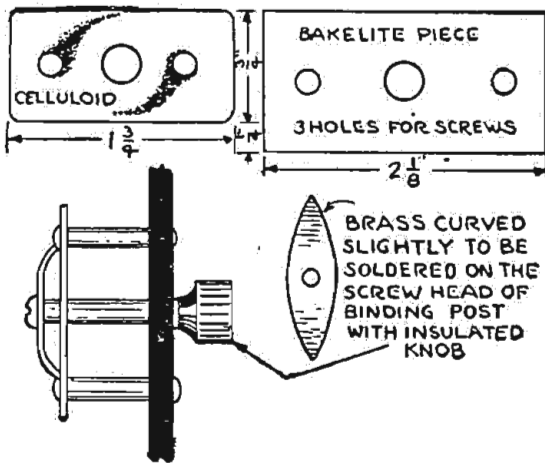
RADIO KINKS DEPARTMENT,
Radio Digest
123 West Madison St., Chicago, Ill.

anyone desiring to take along their portable Flewelling for that camping trip or vacation this summer, they will be wise to use a loop, as the results are practically the same as when I used a regular antenna and also has the usual additional advantages of the loop antenna. By following the hook-up, the method of arrangement is readily seen and the additional cost is quite negligible.

With this super hook-up I have logged 46 stations in one month, none less than 600 miles and the most distant was WSB at Atlanta, Georgia. The airline distance being approximately 1,437 miles from Sydney, N. S. I claim my super hook-up to be original with me, although it does incorporate an idea from Flewelling and uses tuned plate regeneration. I also claim that it is the simplest form of a super set with a loop or regular antenna. I used the Canadian dry cell tube (Northern Electric 215A) with 90 volts on the plate.—Allison D. Trumbull, Sydney, N. S.

Variable Grid Leak

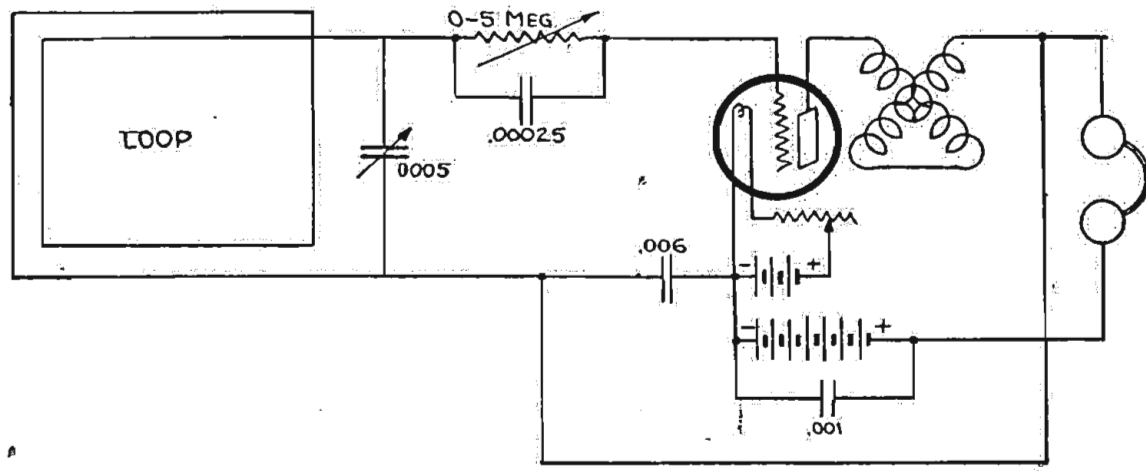
A variable grid leak can be made from the parts shown in the illustration. Three holes large enough for binding posts are made in a piece of celluloid 1 3/4 by 3/4 inches. Other parts required are two



brass bolts with nuts, one binding post with insulated knob, one piece of brass or copper, like the one shown in the sketch, long enough to reach from the center hole and to follow in the ink line on the celluloid.

The piece of brass or copper is soldered to the head of the screw and the insulated

CIRCUIT GOOD FOR CAMP OUTFIT



binding post and the metal index pointer is screwed on the end.

The assembled parts can be either mounted on the panel or on a piece of bakelite a little larger in size than the celluloid. If a condenser is desired the screw heads can be raised above the celluloid with brass pieces or nuts and the condenser mounted above. The line or mark should be made with India ink, and the two points when straight across should almost touch the binding posts at the ends.—Ira N. Faurot, Smith Center, Kansas.

R. R. Spike Good for Portable

Scorn not the lowly railroad spike. It has the makings of a crackerjack antenna or ground and may be a valuable adjunct to the summer Radio kit of any "bug" who would rather swing a few healthy heaves of the hammer than climb a tree to string an aerial.

Take a railroad spike and file it off clean. Then drive it deep into the trunk of a good-sized tree. Use a common ground clamp for making a connection, and you'll find you have a ground of unusual quality. Drive a spike like the first one in another tree and hook it up to your antenna binding post. The tree will do the rest. What could be sweeter?

Old and New B Batteries

It is not advisable to connect old and new plate batteries of the dry cell types in the same circuit. The reason for this is that the internal resistance of the battery increases with the age and a large amount of the energy of the new dry battery is consumed in forcing the current through the high resistance of the old battery. A block of B battery having a potential of 22.5 volts when first put in service may be used until the potential has fallen to 15 volts. Then it should be discarded and replaced by a new battery.

REFLEX

Erla Reflex Transformers

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Finding Battery Noises

Interfering noises in a Radio receiver employing a vacuum tube may be due to current irregularities in the filament battery or in the plate battery. To locate the source of the noises, these batteries may be tested in turn by touching the cord tips of the telephone receivers across the terminals of the batteries. If a click and no further noises are heard when the filament battery is tested in this manner the trouble is elsewhere, but if a hissing sound is heard in the receivers the battery needs charging. If a crackling or snapping sound is heard when the plate battery is tested it should be discarded and a new battery placed in service.

Regenerative Interference

A regenerative receiver, when operated beyond the oscillating point, causes considerable interference with nearby receiving stations. This is due to the fact that oscillations of small power are produced by the set and radiated from the antenna. These oscillations when combined with oscillations transmitted from a Radio-telephone station, produce a beat of audible frequency which seriously interferes with the reception of broadcast music or speech. This interference, due to re-radiation, may be prevented by combining Radio frequency amplification with the regenerative set, thus effectually preventing the radiation of oscillations from the antenna system.

We Will Mail You One

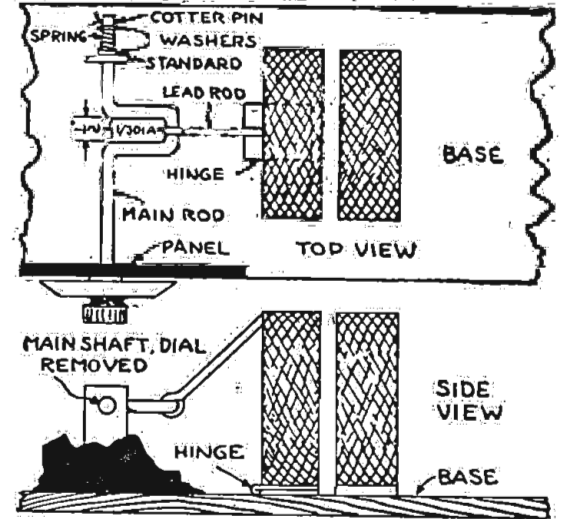


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Back of Panel Mounting for Two Honeycombs

The accompanying illustration shows a method of mounting two honeycomb coils back of a panel. The main rod or shaft may be of No. 6 wire or 1/8-inch brass rod, 8 to 10 inches long. The lead may be a piece of No. 8 or 10 wire of suitable



length. A washer must be placed between the dial and panel to keep the dial from rubbing. The spring at the end of the rod is to keep a strain on the rod and coil to prevent its moving of its own accord. The loop in the main rod equals one-third of the diameter of the movable coil (outside diameter). —E. A. Boepple, Rocky River, Ohio.

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 - 6—Flewelling Flivver
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- These helpful prints designed by a Member of the Institute of Radio Engineers. All ten mailed prepaid for five dollars (\$5) or single prints at 75c apiece. Send money order or check (no stamps).

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How to Make a Flewelling Receiver

BLUE PRINTS

for the construction of a Flewelling Receiving Unit and two step amplifier.

ALL DETAILS FOR ASSEMBLY

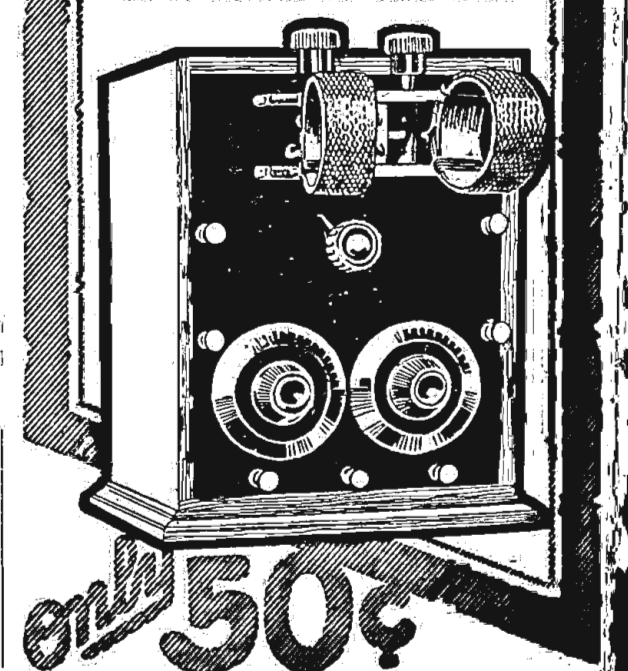
Description of apparatus and accessories and details of tuning.

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23 Plate Vernier; value, 6.00.....	4.00
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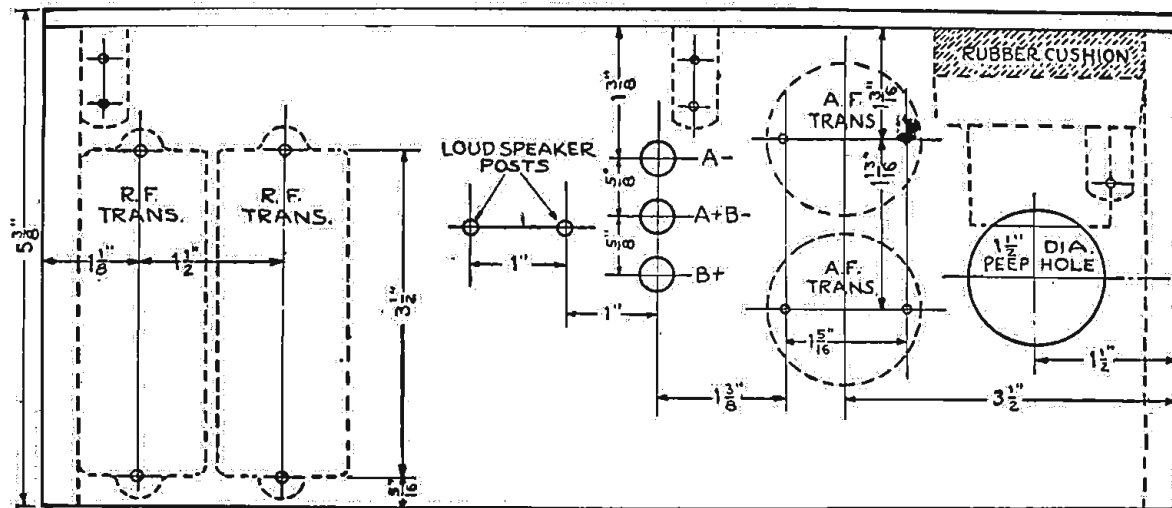
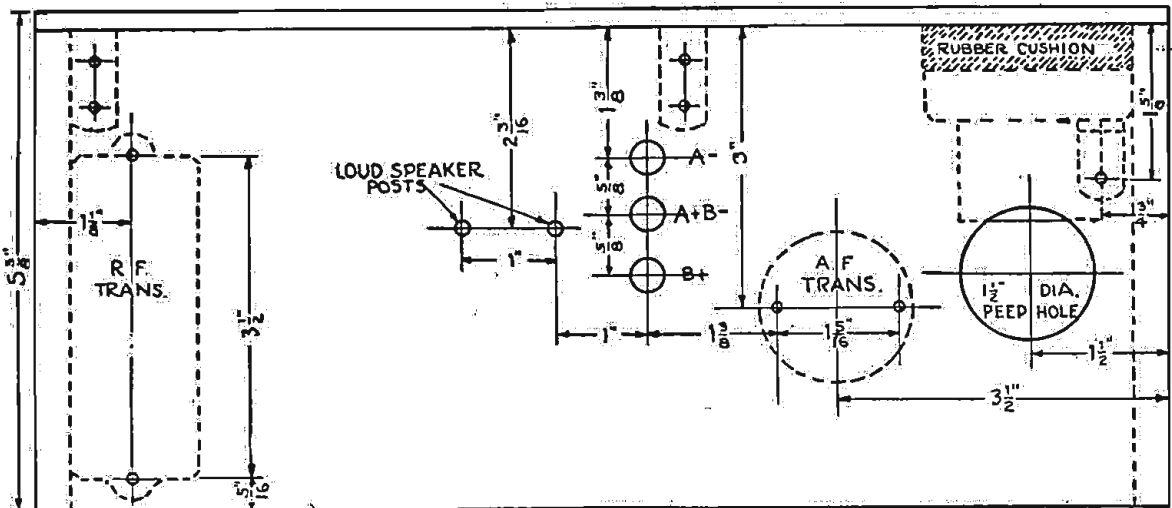
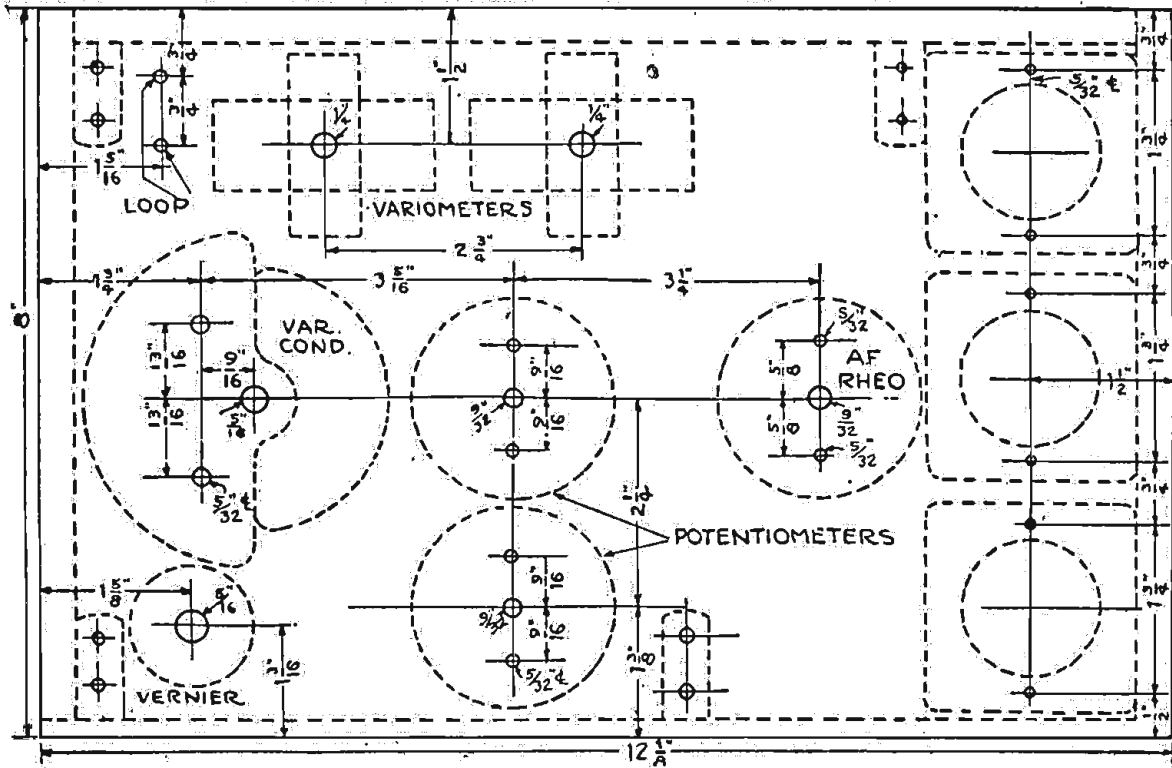
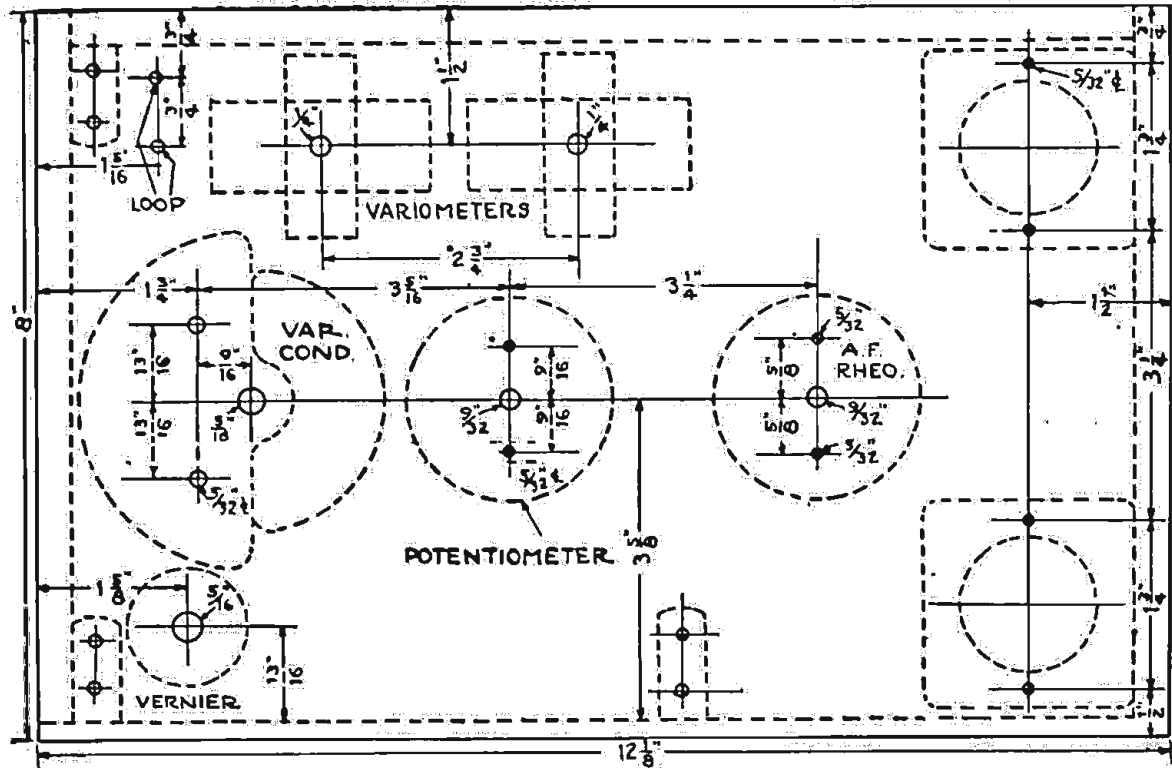
Two-inch Dials, same design, for rheostats and potentiometer; special at.....	\$0.25
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How to Make a Camper's Portable Reflex Set

Part III—Panel Layouts

By H. J. Marx



Layout for Reflex Number One

Layout for Reflex Number Two

REGARDLESS of which of the three circuits the constructor contemplates using, the sizes of the two pieces of panel stock for the top and side remain the same. The variations are simply a question of changes in the number and location of the drilled holes for mounting the apparatus.

Compactness is a valuable asset in reflex circuits, but the arrangement of the apparatus, to avoid interference, is very important. The position of the audio frequency transformers with respect to the Radio frequency transformers must be given a little consideration. Watch to see that any magnetic field that may emanate from the audio frequency transformer will not be in a position to affect the windings of the Radio frequency transformer. The variometer also should be kept away from any position where it would be affected by the magnetic field of the transformers.

Resilient Socket Mounting

Because dry cell tubes are to be used, and on account of their microphonic nature, some form of resilient mounting for the tube sockets is advisable. The black sponge rubbers used by draftsmen make very good cushions. They should be cut to match the base of the tube socket. In order to get a real cushion effect, it is not sufficient to merely insert the rubber under the sockets and then to pull up tight on the screws holding it. The socket should be attached to the rubber cushion with one set of screws and the rubber to the panel with another set of screws. Any shocks or jars cannot be transmitted through the screws, but are absorbed by the rubber cushions. A flexible lead should be used between the terminals on the sockets and the bus bar wiring. If the heavy bus bar wiring is connected directly to the socket binding posts, it again helps to add rigidity and permits the transmission of shocks and bumps.

Corner Angles

The small brass corner angles that can be purchased in the five and ten-cent stores will come in handy for panel assembly and also for mounting any sub-panels, as was used in the four-tube hook-ups for supporting the three audio frequency transformers. In using these an-

gles and brass screws, a little care and attention is necessary in order to avoid additional connections and short circuits where they come in contact with other apparatus, such as condensers and transformers.

Another convenience is the use of the small brass drilled strips bought in the same manner. They often come in very handy for set assembly. One was used for mounting the crystal detector direct to the grid terminal of the secondary of the Radio frequency transformer.

Reflex Number Three

The panel layouts not only give the locations for the mounting of apparatus, but also show in dotted lines the position of the sub-panel and the three small audio frequency transformers.

A small variable condenser with a cross section about the size of a quarter was used as a vernier and connected in parallel with the large variable condenser.

The cushion mounting of the sockets is illustrated in the view of the side panel.

The mounting of the sub-panel is left to the ingenuity of the constructor since it is simply a matter of using brass angles. Slight variations in location are immaterial.

Two 1/2-inch peep holes are drilled in the side panel for observing the filament lighting of the tubes. These diameters can be increased if desired. The two Radio frequency transformers are mounted on the inside of the panel.

For battery connections the small telephone cord tip jacks were used. Regular binding posts are mounted for the loud

speaker terminals. Care should be taken in mounting the (Continued on page 14)



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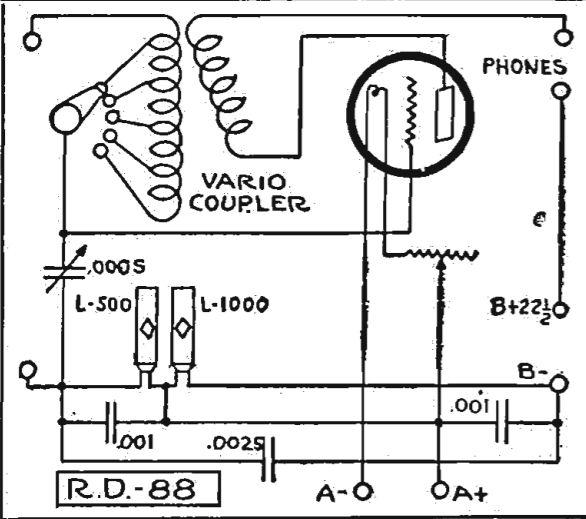
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THE problem of a good circuit for a portable set using a loop aerial can be very satisfactorily solved through the simplified type of a single tube super regenerator. A typical circuit of this type is presented as RD-88.

The loop should be about 2 feet square with about 12 turns spaced 1/2 inch apart. The wire can be about No. 20 gauge single or double silk covered.

Any of the standard type of variocouplers can be used. The variable condenser gives best service if it has the vernier adjustment feature. The two honeycomb coils are connected in series with a coupling adjustment. A standard two-coil mounting should be used. The fixed condensers should be of the mica type, as the paper condensers are too unreliable in capacity values.

This circuit will give satisfactory service with practically any type of tube. With hard tubes the plate voltage can be increased.

FIRST STEPS IN RADIO

(Continued from page 11)

Thus when a difference of potential across this condenser was varied by variations in the plate voltage, the changing values were impressed upon the grid circuit, giving a feed-back effect and regeneration. This circuit is used in a somewhat different form at present, shown at B in Figure 36.

The variable condenser in the aerial circuit will be found to have a positive potential applied to one set of plates and the other plates being connected to the negative of the B battery through the phones. Thus when the plate current is varied by the original signal wave current, the potential across this condenser will vary and current impulses will be impressed upon the grid circuit to assist those from the wave, thus giving regeneration.

The action is assisted by the inductive effect of the variometer in the aerial lead, the self induced current in it increasing the variation in the potential differences across the variable condenser.

With this circuit the grid leak is very critical, for the positive of the B battery reaches one side of the grid condenser and if too much escapes across through the leak, the grid will be unable to assume an appreciable negative charge from the incoming wave and the set will not be sensitive.

Modification of the Circuit

A modification of this circuit that is somewhat superior to that just described is shown at C in Figure 36. The action is identical but the regeneration is easier to control and the signals are somewhat louder by reason of the tuning inductance being connected to the grid and plate.

The application of regeneration to double circuit tuners is identical in principle, the only difference being that the energy is transferred to the secondary tuning circuit instead of to the aerial circuit, although the latter method is occasionally used, the aerial circuit in turn transferring it to the secondary. The simplest form of inductive feed-back in the two circuit tuners is the three-coil honeycomb or spider web circuit. In this arrangement, three coils are arranged close together, the center one or secondary being fixed in position, the other two being so mounted that they may be swung to the side. The coil on the left is usually made the primary or aerial inductance, while that on the right the tickler.

In operation, the left hand coil is used to vary the coupling between the aerial and secondary circuit for best selectivity. Then by moving the coil on the right the proper amount of current can be transferred from the plate circuit to the secondary circuit to get good regeneration without distortion.

Sometimes a variable condenser is shunted across the tickler coil to help control the regeneration, which is highly critical. A better method is to connect the variable across the phones, in which position it acts as a throttle to control the amount of Radio frequency currents flowing in the plate circuits and thus assist in controlling the regeneration.

As a rule, a variable condenser across the phones instead of the fixed condenser used there in most regenerative circuits, will permit better control of the operation and may overcome the squealing and howling that cannot be completely cleared up in many sets.

There are numerous methods of inductively coupling the plate circuit to the secondary, but as a general rule no circuit should be used where a change in tuning will vary the feed-back effect.

For instance, at B in Figure 37 is shown a circuit used by many where one inductance is made to act as the tickler and aerial tuner. It will be very apparent that any attempt to vary the coupling to obtain selectivity will alter the feed-back, or in attempting to control the feed-back the selectivity of the set must be sacrificed.

Various other arrangements of inductively coupled methods are described by the technical press, but a study of the above will show the principle used and will assist in the selection of a suitable set.

Feed-Back in the Reinartz Set

The well known Reinartz tuner is a form of capacity feed-back with a special un-tuned or aperiodic aerial circuit. In Figure 38 is shown a modification of the Reinartz tuner that is somewhat easier to build and will be found very simple in operation. As shown, a tap is taken off one variometer between the stator halves and grounded through a variable condenser. Another variometer is connected to the plate and the other terminal to a .0005 mfd. condenser, which is connected to the aerial lead.

This set functions as a closely coupled two circuit tuner. Half of one variometer stator and the aerial circuit condenser form the primary while the balance of the variometer forms the secondary circuit. Regeneration is obtained in the following manner: The variometer being connected to the plate, the small fixed condenser and the aerial tuning inductance form a tuned circuit between the positive and negative terminals of the B battery. Should a change of potential on the grid cause a variation of the plate current, the voltage applied to the tuned circuit will vary and the currents will flow therein at Radio frequencies.

When this circuit is tuned to the same wave length as the secondary circuit, the currents therein build up rapidly and flowing through the aerial inductance part will be transferred to the grid circuit, and being in phase with the currents therein, will assist them and increase the changes in grid potentials, giving greater signal strength. This circuit is recommended for trial by those not familiar with it, for it has given excellent results wherever used. The action in the regular Reinartz circuit is similar, except that the inductances are varied by taps and the condenser in the plate aerial circuit is made variable.

The Three Circuit Tuner

We come now to the three circuit tuner which is exclusively regenerative and the earliest type of feed-back circuit discovered by Armstrong. The circuit is shown in Figure 38 and is usually known as the variocoupler-two variometer circuit. The action here is rather difficult to explain.

When the set is operating the plate current is varied by the changing potentials on the grid. Each change of the plate current is opposed by the inductive action of the plate variometer. Thus when the plate current is decreased by a negative charge on the grid, the plate variometer tends to keep the current flowing through the tube and bulks up the plate voltage.

The increase of positive potential on the plate induces a greater negative charge on the grid by electrostatic attraction, which in turn reduces the plate current still lower, giving a greater change in plate current than would result from the original negative charge on the grid. The plate circuit is tuned to the incoming wave and thus the inductive action of the plate variometer is properly timed to act in synchronism with the Radio frequency currents in the grid circuit.

The proper operation of this circuit demands the adjustment of three different circuits to obtain maximum signal strength and therefore is more difficult to adjust. As a rule, it is unsatisfactory to the beginner for its great selectivity and difficulty in tuning a station, but once the

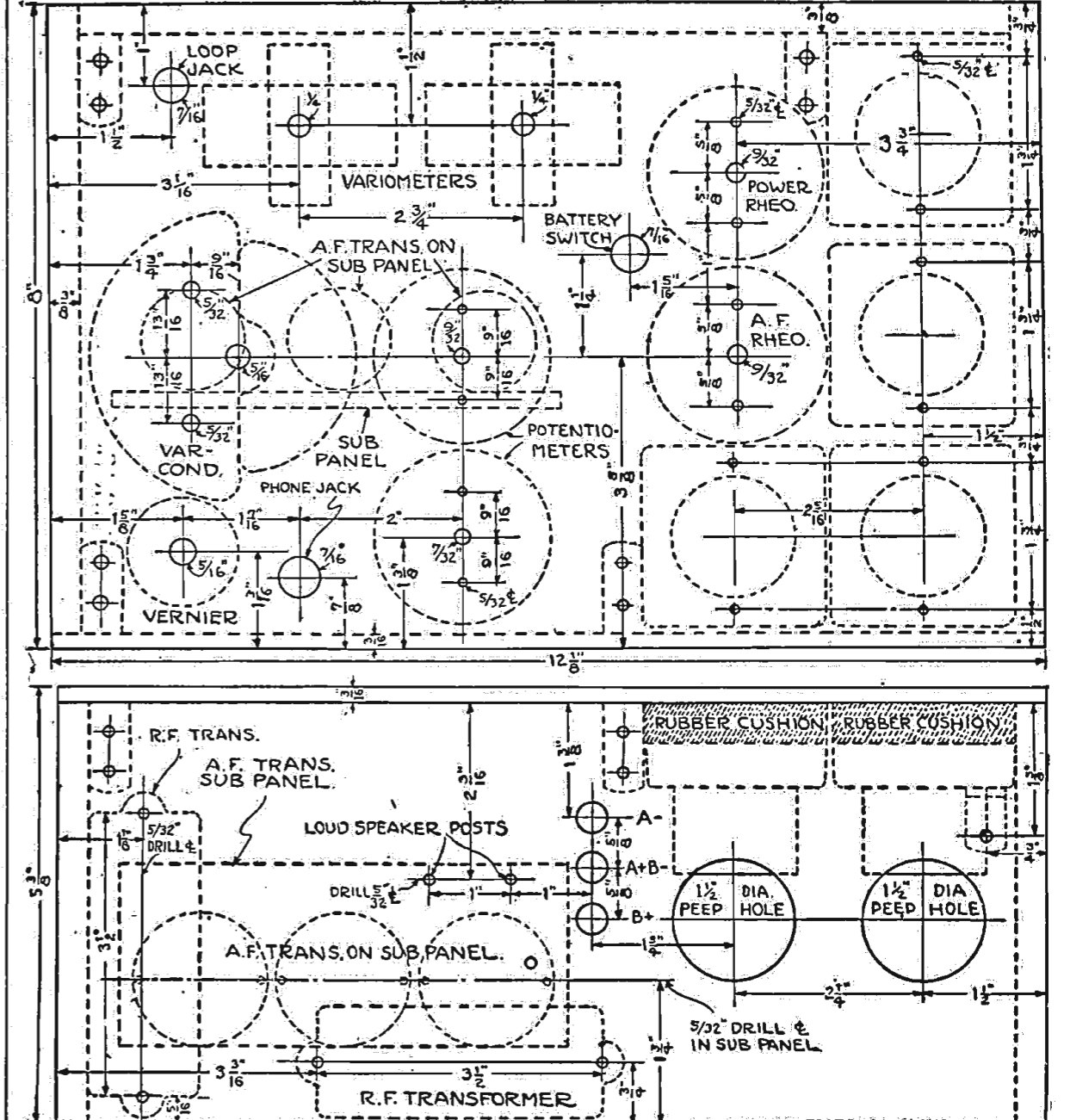
PORTABLE RECEIVER

(Continued from page 13)

apparatus so as not to interfere with the wooden strips in the carrying case. This also holds true when wiring the set.

mounted on the side panel in this layout, and the sub-panel eliminated. The one peep hole is dispensed with also.

Two binding posts take the place of the loop jack. The Radio frequency transformers are mounted on the sub-panel



Layout for Reflex Number Three

Reflex Number Two

The panel layout for the three-tube circuit is slightly changed from that of the four-tube set. The control apparatus is the same, except that the rheostat for the separate audio frequency tube has been eliminated.

The loop and phone jacks and the battery switch have also been eliminated. The audio frequency transformers are also

knack of handling the tuner is mastered, it is second to none for long distance reception with amplifiers.

Body Capacity

In most regenerative tuners the approach of the hands to adjust the dials untunes the set. This is termed body capacity and is due to the fact that any conductor brought near the set forms one plate of a condenser and thus changes the tuning of the circuits. This is prevented by shielding the set by fastening sheets of conducting material to the back of the panel and grounding to the ground terminal or to the negative filament.

The wiring of a regenerative set should be such as to prevent any feed-back to the grid circuit other than that provided for in the instruments themselves. It is apparent that any lead in the plate circuit which lies parallel to the grid circuit lead would induce currents in the latter either by inductive or electrostatic action. Therefore separate all wires carefully and let them cross only at right angles.

(TO BE CONTINUED.)

alongside of each other.

Reflex Number One

The panel layout of the two-tube circuit becomes very simple with plenty of room for mounting of apparatus and accessibility. One of the sockets and one of the potentiometers are eliminated, otherwise the top panel presents no variations from the three-tube layout.

In the side panel layout, just one transformer of each of the two sets is eliminated.

(TO BE CONCLUDED.)

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Questions and Answers

R. D. 68-69.

(3056) ECF, Nanuet, N. Y.
In your Jan. 6th issue you printed a R. F. and an A. F. three-coil regenerator (R. D. 68-69).

I constructed one of these sets and would like to have some information about it.

Your diagram calls for primary 35, secondary 50, tickler 75. I find that better results are obtained with a primary 75, turns on a secondary or tickler of 50 turns, and then I must place my secondary at right angles to the primary. Is there any way I can overcome this? Will coils of more turns help me?

I do not seem to be able to tune in distant stations while the local stations are broadcasting. Is there anything you can suggest that will make this possible?

What are the VT-2 and E tubes you recommend for the 2-step and where can I get them? Will these tubes give me better results than the two Cunningham tubes I am now using?

What transformers are the best for audio frequency amplification and is it necessary to have a high and low ratio transformer, and which is placed first?

Can you furnish me with a panel diagram and size for the two cabinets?

A.—Noting your specifications and experience in operation of R. D. diagrams 68-69 will advise that a discrepancy is indicated in the variance of coils best functioning contrary to those shown in diagram. Values as specified are correct and should afford the best results. The circuit is selective and capable of discrimination in reception. Would advise a careful review of connections to determine what factor is acting as a deterrent to operation of set.

VT-2 and E tubes are manufactured by the Western Electric Company, but would not prove of sufficient advantage to warrant a change from those now employed.

Transformers of standard type having ten to one ratio on first and three or four to one ratio on second stage of amplification are used for audio frequency.

Panel construction is largely a matter of personal discrimination. Regret that we have no constructional data to offer for set in question.

Condenser Values.

(2908) JAG, Frederick, Okla.

How many square inches of soft copper tinned on one side would it take to make a variable condenser of .001 mfd. capacity? Give the thickness of the metal.

Would some other material be better than the copper? If so, what kind, and why?

What is the best dielectric and how thick should it be?

Where can I obtain all necessary materials?

Would you advise the use of amperite current adjusters on amplifier tubes?

Is there any way to measure resistance and capacity without a lot of expensive instruments?

A.—We are pleased to answer your inquiries as follows: For a book type condenser a sheet of soft copper tinned on one side 3 by 4 inches and separated either by a very thin piece of mica or heavy wax paper will approximate a .001 mfd. Tin-foil pasted on wood forms could be used but would be no better.

Mica is the best dielectric, .003-inch thickness, if possible. Materials in question should be obtainable at any Radio supply store. Amperite current adjuster is very good, probably more effective than a rheostat.

Resistance may be calculated or measured with an ammeter. Capacity is rather difficult for a novice to arrive at without special apparatus designed for the purpose.

Reinartz and R. F.

(4124) WGG, Tucson, Arizona.

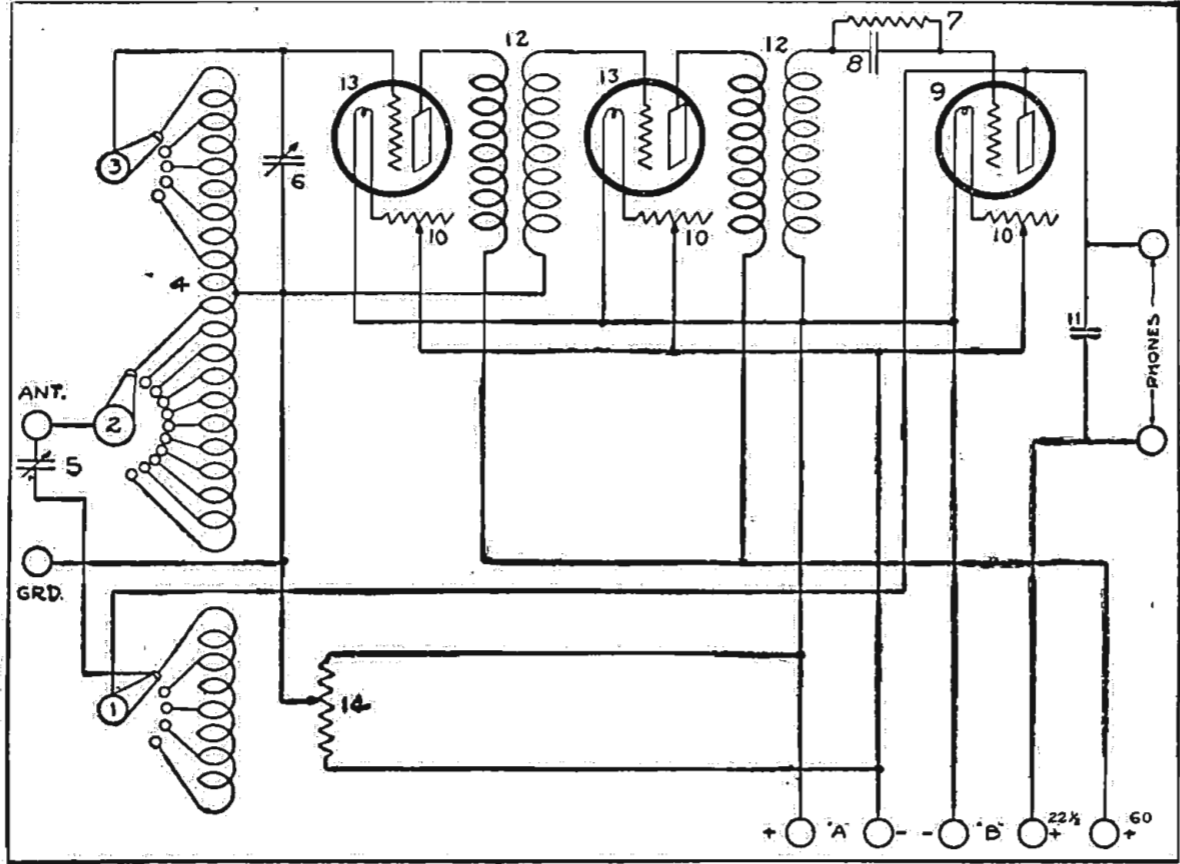
How may I add two stages of untuned transformer Radio frequency to my Reinartz circuit?

Will I need a variable grid leak in the above requested circuit?

How may I wind a Reinartz coil for use up to 750 meters?

In the above requested circuit will a 23-plate condenser work as well as the 13-plate condenser shown in the antenna circuit?

A.—Answering your inquiry we are advising that the employment of Radio frequency amplification in the Reinartz cir-



cuit has not always been found to be practical. However, we are referring you to the diagram on this page. No grid leak is indicated.

A Reinartz coil wound to accomplish 750 meters wave length would be cumbersome and impractical. It is advised that circuit be loaded by placing a 35 turn honeycomb coil in the antenna circuit and secondary circuit, grid lead, respectively. A twenty-three plate variable condenser can be used.

Flewelling Queries.

(2856) ABS, Fort Smith, Ark.

Your name was handed me by the St. Louis Post Dispatch Radio Department, as being in position to answer the following questions concerning the Flewelling Circuit:

What vacuum tube would you suggest as the best detector and amplifier?

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With No. 502 Diamond Wound Coil, as shown in illustration \$13.00

Kellogg Switchboard & Supply Company CHICAGO

Do the book type variable condensers function best, if so, what kind?

Will the Jefferson transformers No. 45 give appreciably greater and clearer amplification than Myers AF choke coils?

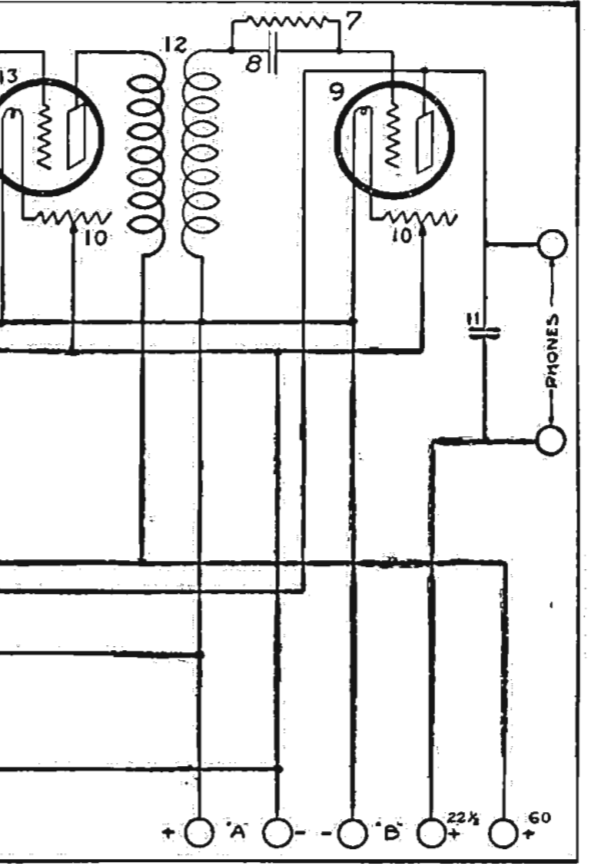
What should I use as grid-leak?

Please furnish detailed Flewelling hook-up and one stage of transformer or choke coil (whichever functions better) amplification.

Will .005 condensers function as well as .006 condensers?

Using two G-R coils will a double or triple coil mounting function better?

How can hand capacity effect while tuning with H. C. coils be eliminated?



What size panel do you recommend this set to be placed on?

A.—Answering your inquiries with relation to the Flewelling circuit will advise: That selection of suitable tube may be made from Western Electric VT-2, UV-202 and 201. WD-11 using one and one-half volt dry cell is also effective considering the amount of current consumed.

Would not advise use of book type vari-

able condenser as it is not efficient.

Jefferson transformers No. 43 will afford better and clearer amplification than audio frequency choke coils.

Pencil line or any standard variable grid leak will serve.

Page thirteen of December 9 issue of Radio Digest contains complete details and panel layout for method of audio frequency amplifications. Blueprints can be secured for fifty cents through our book department.

Would advise a strict adherence to capacities designated by author of circuit, condensers, etc.

A double coil mounting is all that is required, although a three-coil mounting may be used in order that if it seems desirable to use a different hook-up at any time a new mount is not necessitated should new hook-up require a three-coil mount.

Body capacity effect experienced in tuning honeycomb coils can be reduced by placing them in the back of cabinet and shielding cabinet, grounding shield.

In making this circuit, as before stated, a strict adherence to specifications is advised, to assure the results possible with this popular circuit.

Mr. Flewelling has been writing for Radio Digest on the subject of the circuit which bears his name, and you will without doubt find interest and helpfulness by reading his articles.

About WD-11 and WD-11A

The dry cell tube known as the WD-11 may be used either as a detector or an amplifier. Due to the fact that this tube is more highly evacuated than the usual type of gas-content detector tube, it is less critical in adjustment. A slight change in mechanical design is the only difference between the WD-11A and the WD-11, as these tubes have the same characteristics. A plate potential of about 20 volts should be used when operating this tube as a detector and 40 volts as an amplifier.

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Illustrated

May Murray, the famous moving picture actress, in the garb of a role she recently starred. A few weeks ago she gave Radiophans a treat with a talk from Station WOR on dancing. A great many actors and actresses in the motion picture profession have used the microphone to further their popularity with the great open audiences in the country and places wherein they cannot reach in person.

Photo by Edwin Bower Hessler

Just a little listening-in party, the party being Miss Peggy Stohel, at the camp. Seventy-five per cent of the persons who travel to vacation lands in cars have their Radio sets with them. If they do not have cars, the sets are sent as baggage.

© K. & H.

Dogs are usually much interested in the voice from the Radio set, but Whiskers seems to be in a doleful mood, while his master, Charles Ray, movie star, is enjoying it immensely. Radio is a great pastime for the idle hours of those in the movie profession.

© Photonevs



You may just as well start the baby on "Radio food," for it is bound to need it sooner or later. This shows Jim Little listening in on a concert just before he is put to bed for his afternoon nap. Jim is a modern fellow, and now that he has been started on the Radio trail he will not go to sleep until his Radio requirements have been filled.

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